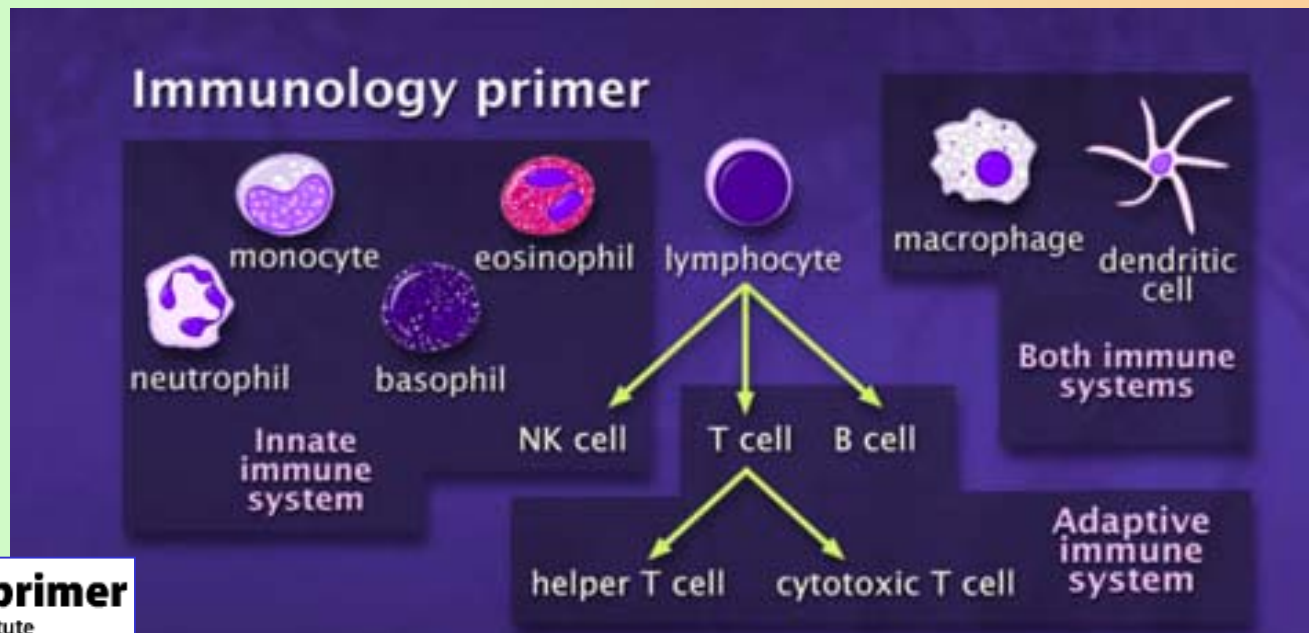


Immunology

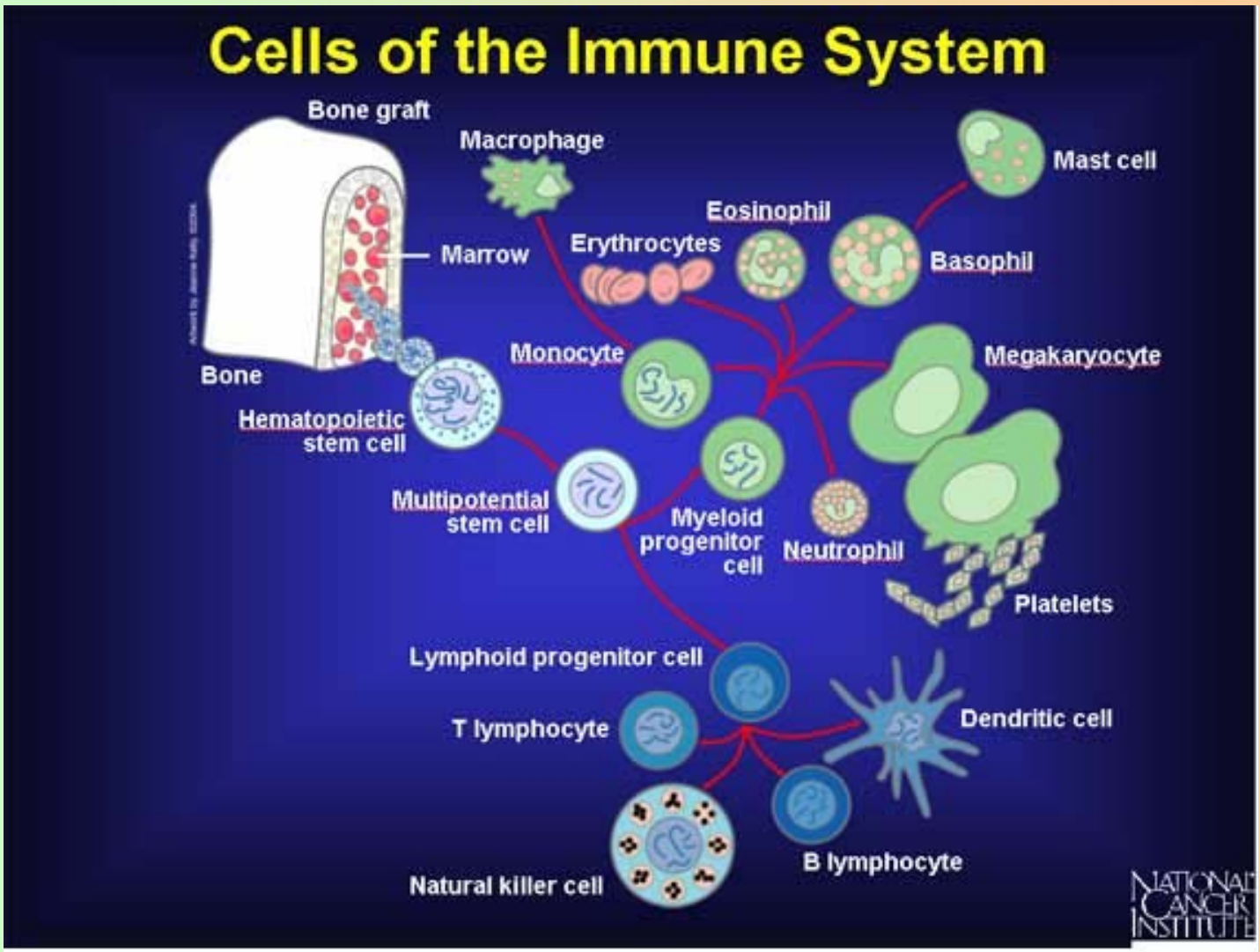
Innate vs. adaptative immunity

All animals possess a non-specific defense system called the **innate immune system**. Innate immune responses attack microbes indiscriminately.

Vertebrates have an additional and powerful immune response called **adaptative immunity**.

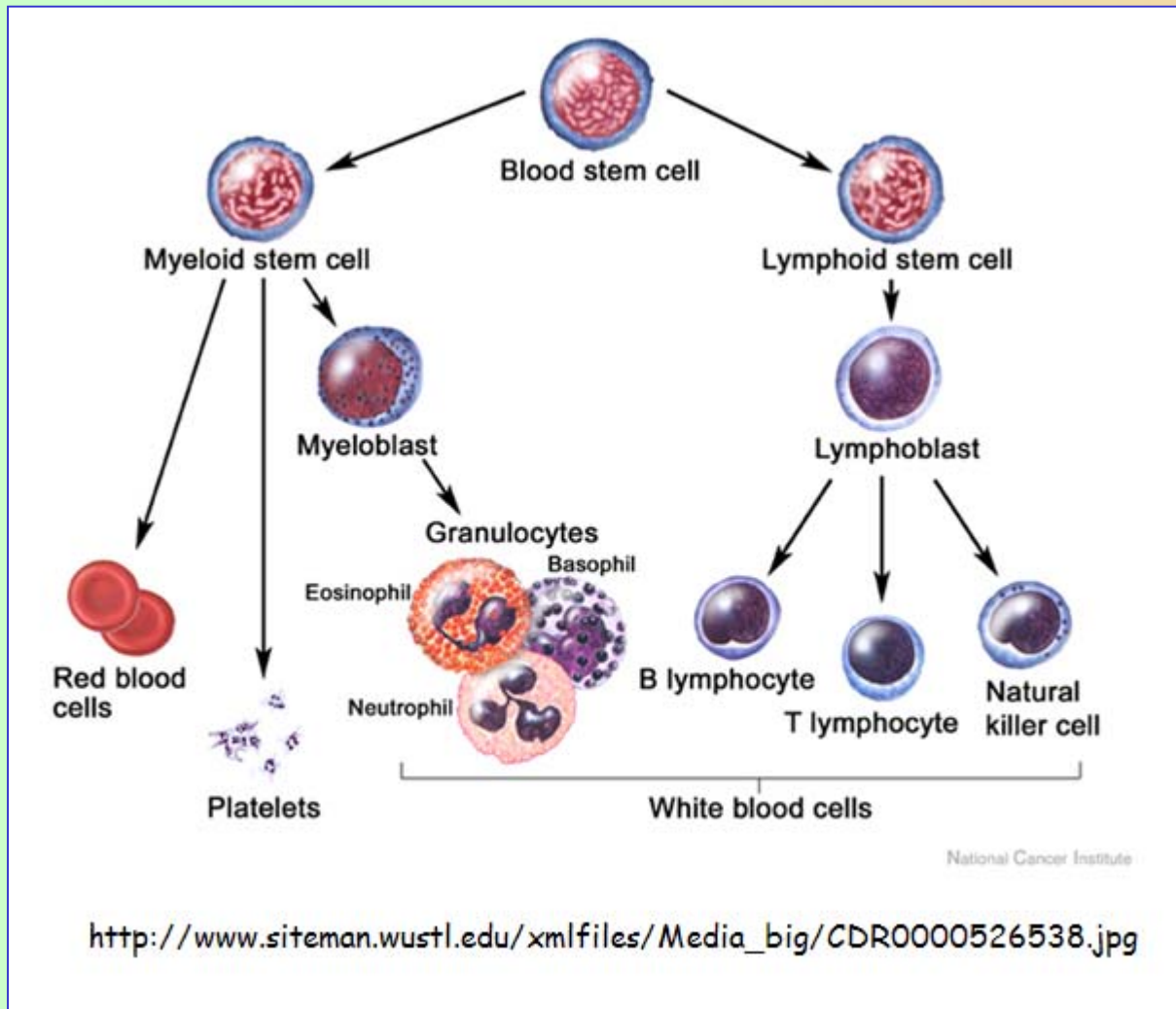


Immunology



http://www.web-books.com/eLibrary/Medicine/Physiology/Immune/Immune_Cells.jpg

Immunology



Innate vs. adaptative immunity

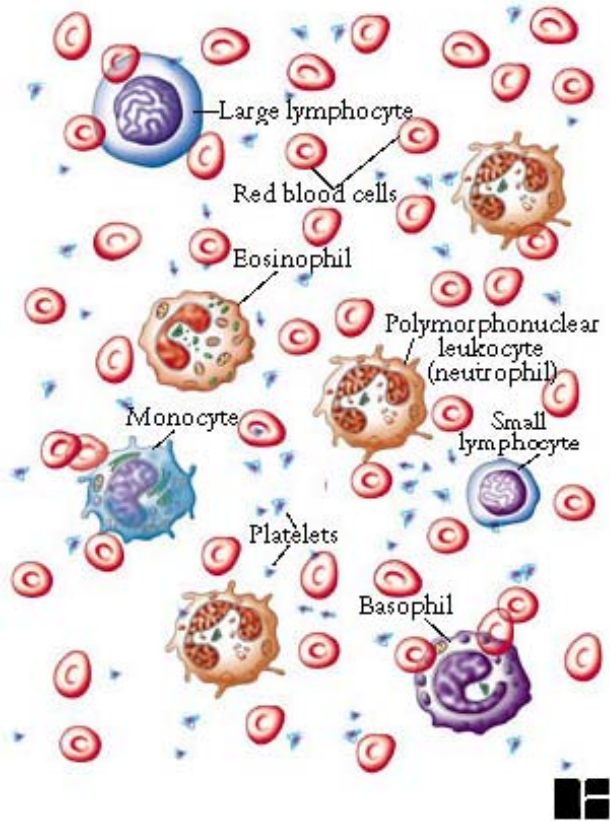
A key feature of adaptative immunity is that the response is stronger and swifter with repeated exposure to a pathogen.

The **B** (bone marrow) and **T** (thymus) **lymphocytes** of the white blood cells form the backbone of the adaptive immune system

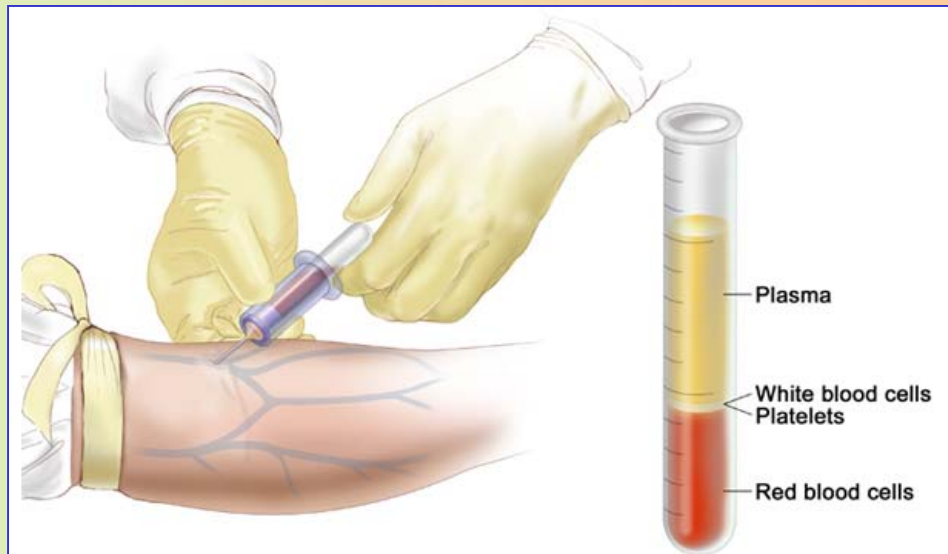
Immunology

The blood system

Blood is composed of 52-62% liquid plasma and 38-48% cells. All blood cells are manufactured by stem cells, which live mainly in the bone marrow. There are three types of blood cells: **erythrocytes** (red blood cells), **leukocytes** (white blood cells), and **thrombocytes** (platelets).

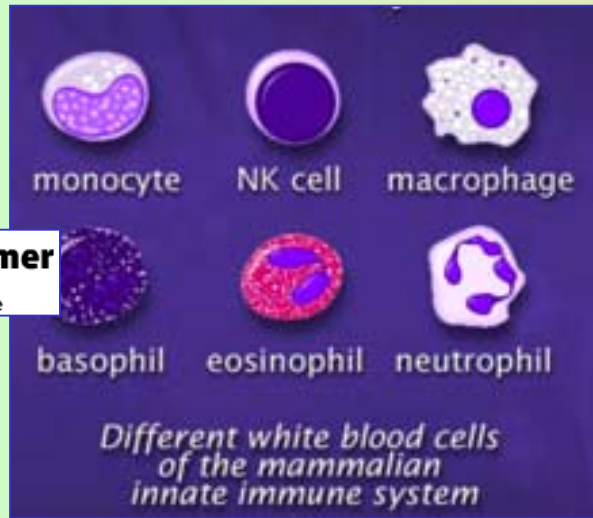


<http://uhaweb.hartford.edu/bugl/images/immcells.jpg>



http://www.siteman.wustl.edu/xmlfiles/Media_big/CBR0000526546.jpg

Immunology



Immunology primer

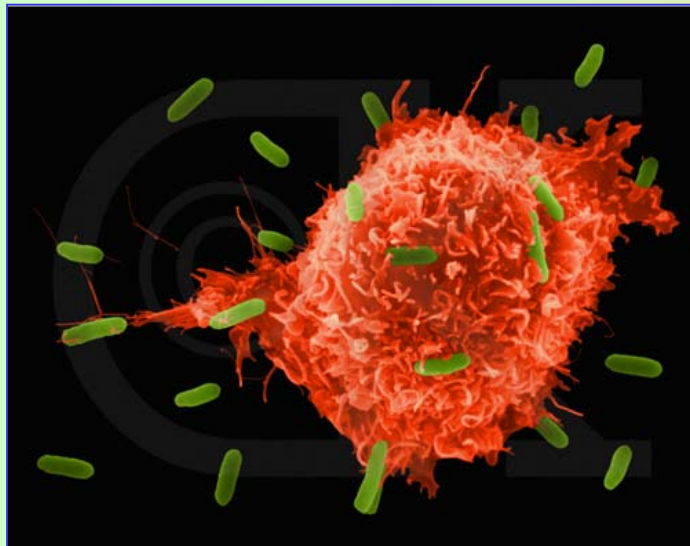
Howard Hughes Medical Institute
<http://www.hhmi.org/biointeractive>

Innate immune system

They include anatomical barriers, secretory molecules and cellular components.

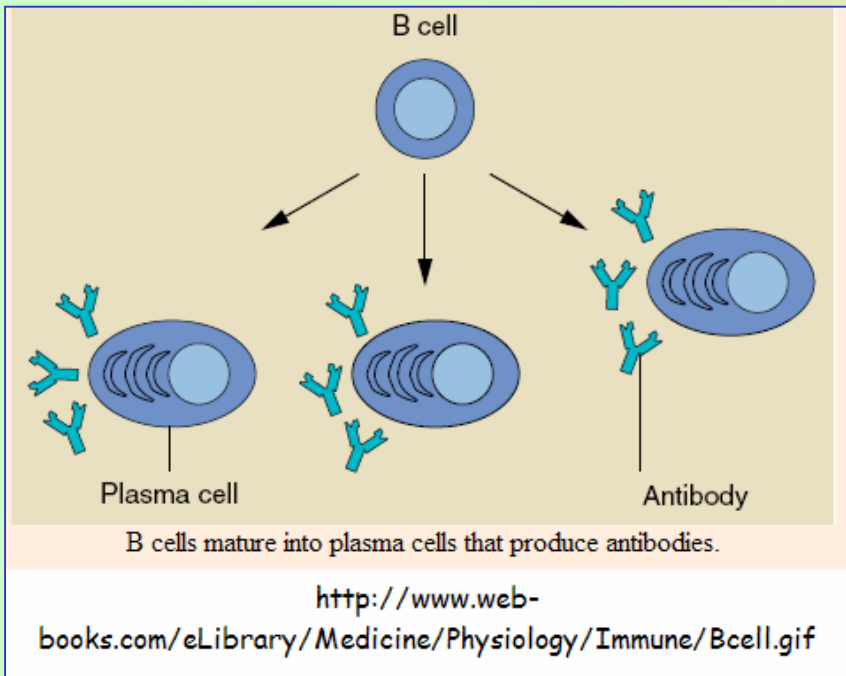
CELLULAR BARRIERS TO INFECTION

Part of the inflammatory response is the recruitment of eosinophiles and macrophages to sites of infection. These cells are the main line of defense in the non-specific immune system



<http://pathmicro.med.sc.edu/ghaffar/macrophage-ecoli2.jpg>

Immunology



Adaptive (acquired) immune system

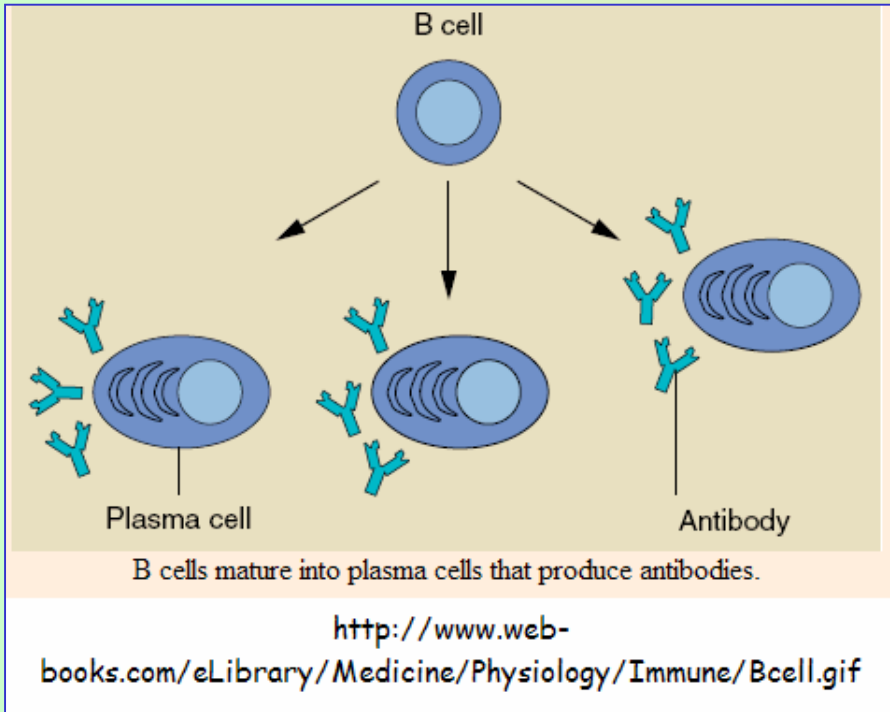
B cells

B cells release **antibodies** into the bloodstream to bind to microbes and neutralize them.

Each antibody is highly specific in binding to a particular molecular component of a microbe.

Each B cell is programmed to make one specific antibody. For example, one B cell will make an antibody that blocks a virus that causes the common cold, while another produces an antibody that attacks a bacterium that causes pneumonia.

Immunology



Adaptive (acquired) immune system

B cells

When a B cell encounters its triggering antigen, it gives rise to many large cells known as plasma cells. **Every plasma cell is essentially a factory for producing an antibody.** Each of the plasma cells descended from a given B cell manufactures millions of identical antibody molecules and pours them into the bloodstream.