

Unit 1: Lesson 3 – The Adaptive Immune System

GLOSSARY

Antibody

Y-shaped proteins produced by B cells that are specific to a particular pathogen and can neutralize it. Five different classes of antibodies occur which have distinct functions.

Antigen

Part of a pathogen that generates an immune system response because it is recognized by cells of the immune system.

Antigen-presenting cells (APCs)

Cells that display antigens on their surface to activate adaptive immune responses to pathogens. The main types are dendritic cells, macrophages, and B cells.

B Cells

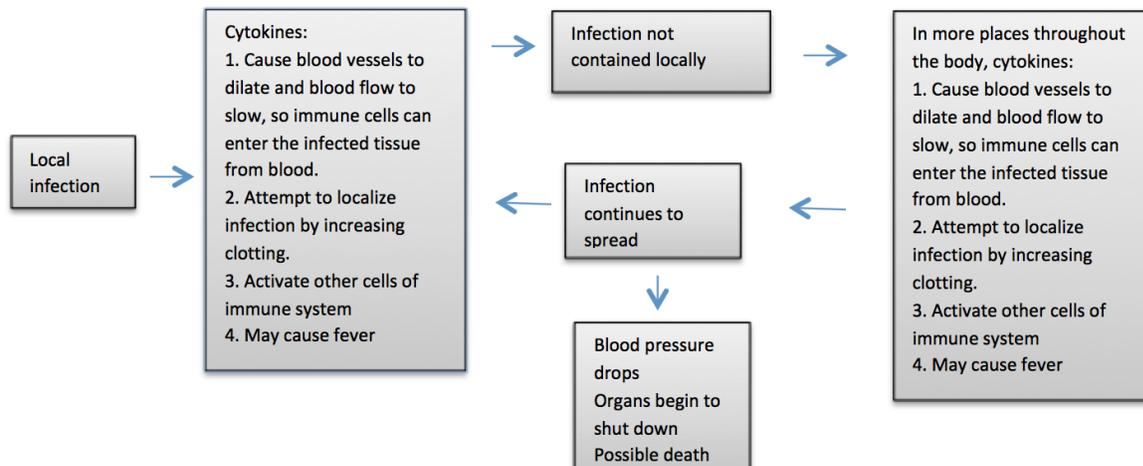
Cells formed in the bone marrow that produce (and secrete) antibodies. They also serve as antigen-presenting cells and some are long-lived memory cells.

Cytokines

Small protein molecules that play a role in all phases of the immune response. They mediate the innate immune response with several functions:

- Cause fever
- Activate other immune system cells
- Decrease ability of viruses to replicate
- Cause clotting to keep an infection localized

If the immune response gains too much momentum, such as can occur when an infection is not kept localized, too many cytokines can be released leading to septic shock. This is sometimes referred to as a “cytokine storm.”



Dendritic Cells

Technically considered an innate immune cell, these cells also play a central role in the adaptive immune response serving as powerful antigen-presenting cells.

Macrophages

Long-lived cells of the immune system that are often found in tissues just beneath epithelial cells. These cells are activated when a pathogen breaches a physical barrier, such as the skin. These cells play a central role in the innate immune response because they ingest pathogens and debris, such as dead cells in tissues. They also release cytokines, which activate other parts of the immune response.

Neutralize

To render a pathogen inactive, so that it cannot cause infection. A typical example is when an antibody binds to a protein on the surface of a pathogen, so that it cannot bind to and infect a cell.

Proliferation

The process of rapid multiplication, such as occurs with B cells following presentation of an antigen by T cells enabling a rapid and specific response.

Protein

Molecules composed of amino acids. Each has a unique, genetically defined amino acid sequence that determines its shape and function.

T Cells

Lymphocytes that directly attack pathogens as well as regulate immune responses through production and release of cytokines. Although these cells originate in the bone marrow, they migrate to the thymus to mature. Three types of T cells include killer T cells, helper T cells, and memory T cells.