

Chapter 39 Immunity

I. Three Lines of Defense

A. Surface Barriers to Invasion

1. _____ is an important barrier.
2. The normal _____ of the gut, and vagina keep the growth of pathogens in check.
3. _____ in the respiratory tract sweep out bacteria and particles.
4. Exocrine glands secrete _____, which degrade the bacterial cell wall.
_____, with its low pH and flushing action, keep pathogens from the urinary tract.

II. Inflammation

A. The Roles of Phagocytes and their Kin

1. White blood cells, produced from _____ cells in bone marrow, not only circulate in blood and plasma, but also reside in lymph nodes, spleen, liver, kidneys, etc. where they stand ready to defend.
2. _____ kinds are swift to act but do not mount a sustained attack.
 - a. _____, the most abundant, phagocytize bacteria.
 - b. _____ secrete enzymes that punch holes in parasitic worms.
 - c. _____ secrete histamine, which sustains inflammation.
3. _____ (formed from immature cells called monocytes) are slower to act but can engulf and digest just about any foreign agent or damaged tissue.

B. The Inflammatory Response

1. Inflammatory response results include:
 - a. _____ and _____ occur at the site of damage or invasion.

b. _____ from blood vessels causing swelling and delivery of infection-fighting proteins to the tissues.

c. _____ and _____ engulf foreign invaders and debris.

d. _____ mechanisms help wall off the pathogen and promote repair tissues.

The blood coagulates and forms a clot; the clot then retracts into a compact mass.

2. While other _____ are being activated, _____ and mast cells secrete histamine, which promotes leakage of fluid out of capillaries.

3. Macrophages will secrete _____, which are communication signals among white blood cells but in addition can signal the brain to reset its “thermostat” to cause a fever.

III. Overview of the Immune System

A. Defining Features

1. Physical barriers and _____ may not be enough to check the spread of an invader.

2. T and B lymphocytes

a. Interactions among these cells are the _____ specific immune system.

b. This system shows immunological _____ and memory.

c. These cells protect us by responding to specific _____ – any molecule that is detected by the immune system.

B. The Key Defenders

1. _____ make blood proteins called antibodies. They do not kill antigens directly. They secrete antibodies that are specific for a particular antigen.

Once an _____ binds to the bacteria or virus, the antibody can then combine with other blood proteins called complement.

The _____ combination kills bacteria and inactivates viruses that are not yet inside cells.

C. Additional Possibilities

1. Antibodies and complements may _____, allowing the bacteria to be engulfed by neutrophils.

_____ cannot bind to most bacteria directly. They will bind to one end of antibody molecules.

2. Some _____ when bound to a pathogen will prevent the pathogen from binding to the host. In this manner, the pathogen cannot initiate disease.

D. B cells differentiate into two types

1. Some are able to bind to the antigen by producing antibodies.

2. Some are _____ that help with later attacks by the same antigen.

E. T lymphocytes

1. Some kill infected cells _____, while some help other immune responses.

a. A special type of T cell called _____ cells can directly kill cancer cells or cells infected with a virus.

2. T cells _____ into two types in the same manner of the B lymphocytes.

a. A group of _____ T cells will recognize and kill it off.

b. The second group of _____ will be ready to make a fast response on the next exposure to the same virus.

IV. Defenses Enhanced, Misdirected, or Compromised

A. Immunization

1. _____ involves a deliberate production of memory cells by a vaccine that is made from killed or weakened bacteria or viruses.

2. If a person has already been exposed to _____, passive immunity can be temporarily conferred by injecting antibodies.

Mother child – breast milk

B. Allergies

1. An _____ is a secondary immune response to a normally harmless substance, an allergen such as pollen or certain foods.
2. Exposure triggers production of a special type of _____ called IgE,
3. IgE binds to cells called _____ cells which trigger an explosive release of histamines.
Mast cells are cells of the immune system.
4. A local inflammatory response results; death can even occur due to _____ shock, a condition in which air passages leading to the lungs constrict, fluid escapes too rapidly from capillaries, and blood pressure drops.

C. Autoimmune Disorders

1. In autoimmune disorders, _____ turn against the body's own cells
2. _____ is an inflammation of the joints caused by antibody that treats the body's own collagen molecules as if they were antigens.

D. Deficient Immune Response

1. When cell-mediated immunity is _____, infections that would normally not be serious become life threatening.
2. In _____ (AIDS), the cause is the human immunodeficiency virus (HIV).

E. Immunological Memory

A. A person is not born with immunity to specific antigens, rather the person has the ability to acquire it.

1. Each _____ or _____ cell is able to synthesize a unique receptor for only one specific antigen.
The whole population of T and B cells thus contains cells that can bind to millions of different antigens.
Even before being infected by a particular type of virus, a person has a small number of lymphocytes that can bind to that particular virus.

