Objectives

To differentiate the two general types of defense of the body from “invasion.”
- Nonspecific
- Specific

To explain the inflammatory response in detail.
To identify the “major player” molecules of the specific immune defense.
To identify and describe the role of the lymphatic system in body defense.

Resistance

The body’s ability to fight off disease.

Immunity – The body’s ability to protect itself.

I. Nonspecific defense – General defense
   A. Physical Barriers
   B. Chemicals & Cells

II. Specific defense
   Combats particular strains of diseases

Nonspecific Defense

Physical barriers
- Skin
- Mucous membranes
- Fluids that contain digestive enzymes.
  Examples: tears and saliva

Nonspecific Defense aka Innate defenses

1) Phagocytes – first line of cellular response by macrophages.
2) Natural Killer cells – target cancerous cells or viral infected cells for immediate destruction.
3) Inflammation – isolate and repair after trauma - WBC’s move in to attack.
4) Interferons
5) Fever

Fevers are the immune systems method of fighting infection.

The normal body temperature is 98.6 degrees Fahrenheit.

When fevers are above 102 degrees Fahrenheit they are a cause for concern. Potential damage to the Central Nervous System can result.

Inflammatory Response

Signs of Acute inflammation:
- Pain
- Swelling
- Heat
- Redness
- Impairment of function e.g. joint movement reduced.
Inflammatory Response

When an injury occurs damaged cells secrete the chemical histamine in order to make the nearby capillary walls more porous. This allows the arriving WBC’s to defend the body by quickly engulfing the invading agents e.g. bacteria. The region becomes red and swollen due to this response mechanism by the circulatory system. It is actually beneficial and allows faster defense.

What if Nonspecific Defenses are insufficient?

I. Cell Mediated Immunity
   T cells – Made in the thymus gland

II. Humoral Immunity
   B cells produce antibodies for a specific response. B cells made in bone marrow.
   - Plasma cells
   - Memory B cells

Molecules involved with Humoral Immunity – No joking matter!

Antibodies:
> protective protein chemicals.
> made by B cells
> circulating in blood and lymph.
> Y shaped molecules that attach, bind and mark antigens.

Antigens:
- Chemicals that generate an immune response.
- “Invading” organisms or particles.

Antigen-Antibody Complex

Role of the Antibody is to “fight” against invaders that are “specifically” I.D. Tag for destruction.

Antibody locks onto antigen like a lock & key. Macrophages come and consume the complex i.e. clean up function.
Cell mediated immune response

Antigen/Antibody Complex can have two effects:
- Inactivation of Antigen
- Complement Cascade – kill invading cells

The Lymphatic System

Organs of the Lymphatic System
- Thymus
- Spleen
- Tonsils
- Lymph Nodes

Lymph Nodes: Function is to filter foreign particles e.g. bacteria, debris and cancer.

Fluid from blood plasma that is not reabsorbed by blood vessels drains into lymphatic vessels. Lymphatic drainage prevents accumulation of too much tissue fluid.