



# **IMMUNE SYSTEM**

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#### AIMS

- What is immunity?
- What is immune system?
- Common terminology
- Immune system arms
- Different types of defense
- Innate and adaptive immunity definition

# immunity

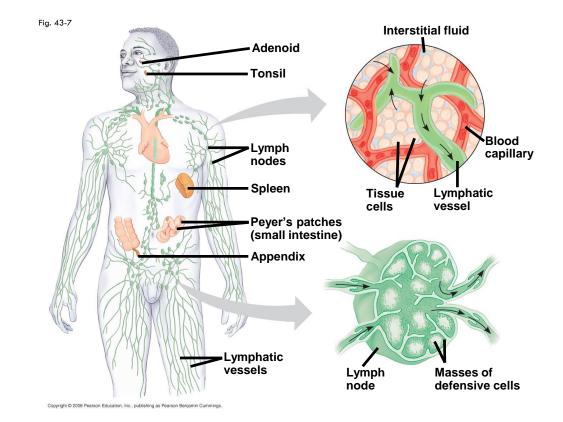
- 3
- Is the state of having sufficient biological defenses to avoid infection, disease, or other unwanted biological invasion.

Immunity involves both specific and non-specific components

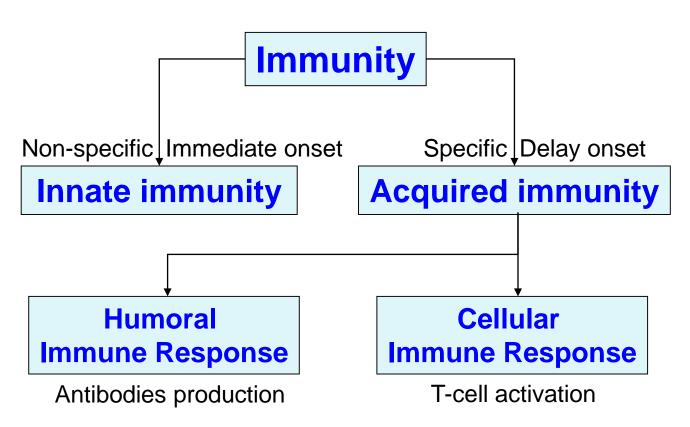
# Immune system

- Is a system of biological structures and processes within an organism that protects against disease.
- An immune system must detect a wide variety of foreign agents from the organism's own healthy tissue.
- The immune system recognizes foreign bodies and responds with the production of immune cells and proteins.

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#### THE EVOLUTION OF IMMUNITY



### The immune system

<u>Immune system</u>

Innate (non-specific) immunity

Anatomic barriers (Skin, mucous membranes)
Physiological barriers (temperature, pH)
Phagocytic Barriers (cells that eat invaders)
Inflammatory barriers (redness, swelling, heat and pain)

Adaptive (specific) immunity

- •Antigen specificity
- Diversity
- •Immunological memory
- •Self/nonself recognition

# **INNATE IMMUNITY**

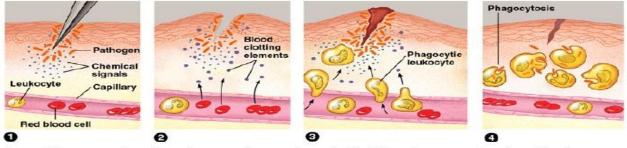
- A white blood cell engulfs a microbe, then fuses with a lysosome to destroy the microbe
- There are different types of phagocytic cells:
- 1. Neutrophils
- 2. Macrophages
- 3. Eosinophils
- 4. Dendritic cells



## Inflammation

#### Localized Inflammatory Response

Fig. 43.5



- 1. Damaged cells release chem signals (histamine, prostaglandins)
- 2. Nearby capillaries dilate & become more permeable; fluid and clotting agents move from the blood to the site
- Chemokines & other chemotactic factors attract phagocytes from the blood
- 4. Phagocytes consume pathogens & cell debris, producing pus

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Pathogens (microorganisms and viruses)

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INNATE IMMUNITY • Recognition of traits shared by broad ranges of pathogens, using a small set of receptors	Barrier defenses: Skin Mucus membranes Secretions
• Rapid response	Internal defenses: Phagocytic cells Antimicrobial proteins Inflammatory response Natural killer cells
ACQUIRED IMMUNITY • Recognition of traits specific to particular pathogens, using a vast array of receptors • Slower response	Humoral response: Antibodies defend against infection in body fluids. Cell-mediated response: Cytotoxic lymphocytes defend against infection in body cells.

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#### Ambition is the first step to success. The second step is action.

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