

Nonspecific Host Resistance

Pages 361 - 382

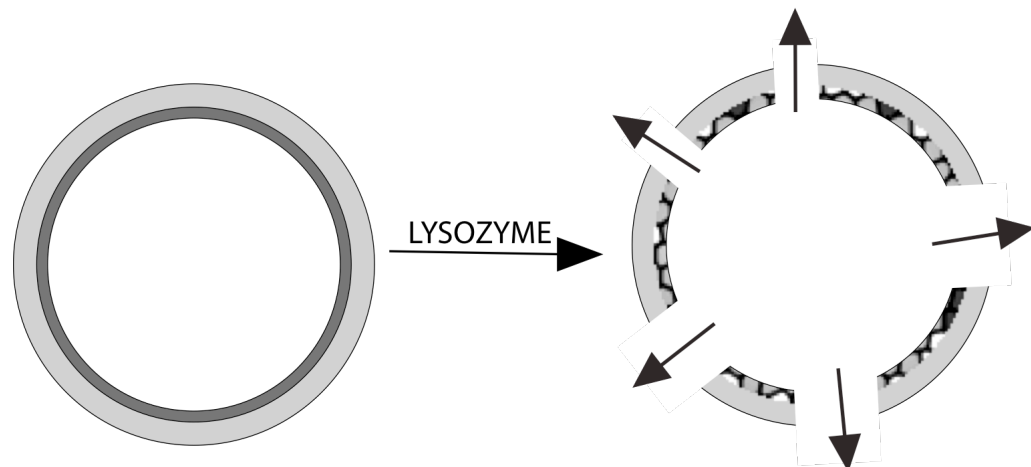
1. Introduction
 - A. Resistance
 - i. Resistance by defense
 - ii. Resistance by alliance
 - iii. Counter attack (Specific Host Resistance)
 - B. Susceptibility
2. Resistance
 - A. Nonspecific (Innate) Resistance (Page 362)
 - B. Specific (Adaptive) Resistance (Page 362) Also See Handout
 - i. Major Histocompatibility Complex
 - ii. Antigen
 - iii. Antibodies
3. “First Line of Defense” (Page 363)
 - A. Physical Factors
 - i. Intact Skin (Page 364)
 - a. Epidermis
 - Keratin
 - Fungal Infections (I.e., Athletes Foot)
 - b. Dermis

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- ii. Mucous Membranes (Page 364)
 - a. Mucous
 - b. Cilia (p. 454)
 - Ciliated Pseudostratified Columnar Epithelia
- iii. Nasal Hairs
 - a. Primary Function (as mentioned in lecture)
- iv. Flushing of Urogenetal Tract

B. Chemical Barriers

- i. Lysozyme
 - a. Tears. Saliva, and mucous
 - b. Lacrimal Apparatus



ii. Acid (Page 365)

a. Stomach Acid

- *Helicobacter pylori*
- Toxins of *Clostridium botulinum* and *Staphylococcus aureus*

b. Sebum

- Unsaturated Fatty Acids

c. Normal Bacterial Flora

- Acid Production

d. Normal Vaginal Flora and Vaginal Acidity

- *Lactobacillus acidophilus*

iii. Cerumen

iv. Sweat

a. Lysozyme

b. Salt and effects

- v. Urine

- C. Normal Bacterial Flora – mutualistic relationships (Pages 365)
 - i. Growth Factors
 - ii. Competitive Exclusion
 - iii. Alteration of Environment
 - a. *Candida albicans*

- 3. “Second Line of Defense”
 - A. Blood Cell Overview (Pages 366 - 368) See also Handout
 - i. Hematopoietic Stem Cells
 - ii. Hematopoiesis
 - B. Nonspecific Phagocytosis
 - i. Types of Cells
 - a. Granulocytes
 - Basophils
 - * Histamine

 - Neutrophils (Page 368)
 - * “First Responders”

- Eosinophils (Page 368)
 - * Parasitic Helminth Infections

 - b. Agranulocytes
 - Monocytes → Macrophages
 - * Fixed Macrophages
 - * Wandering Macrophages

 - Lymphocytes
 - * Specific Host Immune Response
4. Cell Communication (Pages 369 - 375)
- A. Surface Receptors (Page 369)
 - i. Surface Receptors
 - ii. Ligand
 - iii. Cytokines
 - iv. Colony Stimulating Factors
 - v. Interferons (see Handout)
 - vi. Interlukins

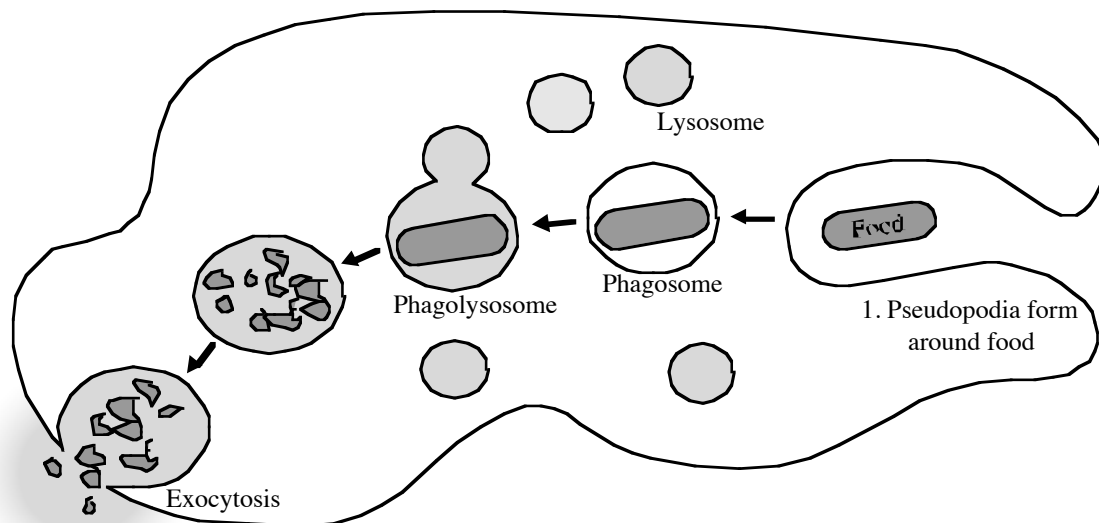
 - B. Complement System (Page 373 - 375) See Handout

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- i. Pathways
 - a. Classical Pathway
 - b. Alternate Pathway
- ii. Outcomes
 - a. Enhanced Phagocytosis
 - Opsonization
 - b. Enhanced Inflammation
 - c. Lysis

5. Phagocytosis and the Inflammatory Response (See Handout)

- | | |
|------------------------|------------------|
| a. Positive Chemotaxis | e. Lysosome |
| b. Adhesion | f. Phagolysosome |
| c. Pseudopods | g. Residual Body |
| d. Phagosome | h. Exocytosis |



iii. Phagocytic Hindrances

a. “M protein” of *Streptococcus pyogenes*

b. Capsules

- *Streptococcus pneumoniae*

- *Haemophilus influenzae* type b

c. Fimbriae

- *Bordatella pertussis*

d. Disruption of phagolysosome

- *Listeria monocytogenes*

d. Escape from phagolysosome

- *Rickettsia*

6. Inflammation (Pages 378 - 382)

i. Types of Inflammation

- a. Acute
- b. Chronic

C. Inflammatory Process

i. Stabilization of Wound

- a. An initial break damages dermal blood vessels and inserts microorganisms
- b. Reflexive vasoconstriction reduces blood flow
- c. Platelets come in contact with collagen fibers and induce clotting
- d. Clot forms and further reduces blood loss and isolates bacterial

ii. Inflammatory response

- a. Mast cells and Basophils secrete histamine
- b. Histamine induces vasodilation of undamaged blood vessels. Other substances, such as kinins, prostaglandins and Leukotrienes will enhance the initial immune response.
- c. If an infection develops the center is called an abscess.
- d. Vasodilated vessels become porous allowing nutrients, oxygen and other resources to enter damaged area. Edema.
- e. Pyrogen secreted elevates local temperature.
- f. Margination, Diapedesis, positive chemotaxis, and phagocytosis by neutrophils followed by macrophages.

iii. Tissue Repair/Injury Resolution

- a. Stratum basalis begins to grow. Blood vessels begin to repair

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- b. Fibroblasts migrate into damaged area and secrete collagen
- c. Epidermis mends
- d. Scab forms
- e. Clot material removed
- iv. Final Stages
 - a. Normal blood flow restored
 - b. Bacterial and damaged tissue removed
 - c. Irregularly placed collagen leaves scar
 - d. Scab falls off.

D. Systemic Inflammation and Fever (Page 382)