IMMUNE SYSTEM

FUNCTIONS

STRUCTURE

• Integumentary System
• Blood
• Lymph nodes/vessels
TWO TYPES OF DEFENSES

<table>
<thead>
<tr>
<th>Non-specific defenses</th>
<th>Specific defenses (immune system)</th>
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<tbody>
<tr>
<td>First line of defense</td>
<td>Second line of defense</td>
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<tr>
<td>Skin</td>
<td>Phagocytic white blood cells</td>
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<td>Mucous membranes</td>
<td>Defensive proteins</td>
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<td>Secretions of skin and mucous membranes</td>
<td>The inflammatory response</td>
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<td>Mast cells</td>
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FIRST LINE DEFENSES

SECOND LINE DEFENSES: Inflammation

- Rubor-redness
- Calor-heat
- Dolor-pain
- Tumor-swelling
- Functio laesa-loss of function
SECOND LINE DEFENSES: Complement

• Histamine release
• Opsonization
• “MAC” (membrane attack complex)

SECOND LINE DEFENSES: Macrophages

defined as abnormal increase in body temperature
normal variation is 1.0 - 1.5C
hypothalamus resets body thermostat
caused by pyogenic microorganisms
accelerates phagocytic and antibody responses
THIRD LINE OF DEFENSE
SPECIFIC DEFENSES: LYMPHOCYTES

ANTIBODY-MEDIATED: “B” LYMPHOCYTES

CELL-MEDIATED: CYTOTOXIC “T” LYMPHOCYTES
**Neutrophil**

- Aka PMN's
- Lobed nuclei
- Fast, non-specific
- First to the scene
- Phagocytosis
- Purple stained

**Basophil**

- Dark Blue stained
- Migrate to damaged tissue and release
  - Histamine
  - Heparin
Eosinophil

- Wright's stain--red
- Bilobed
- Parasitic worms
- Allergic reactions

Monocyte

- Largest leukocyte
- Kidney-shaped nucleus
- Become macrophages

Platelets

- Blood clotting
- Scabbing
- Megakaryocytes
**Lymphocytes**

- T cells attack cells
  - Tumor cells
  - Microorganisms
  - Transplant cells
- B cells produce antibodies

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**INDUCED IMMUNITY**

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**Rheumatoid ARTHRITIS**