

Immune System

How we stay free of diseases
(most of the time...)

Function (or job) of the Immune System

- Function of the Immune System:
It protects against disease-causing agents.
 - Also gets rid of abnormal body cells.
- Pathogen: any disease-causing agent.
 - Ex: Bacteria, Viruses, Fungi, & Parasites

Pathogen Comparison

Bacteria

vs. Virus

n Examples:	<i>E. coli; Streptococci; Chlamydia</i>	
n Are they living?	⦿ <i>Yes</i>	
n Can they reproduce?	⦿ <i>Yes</i>	
n Do <u>antibiotics</u> work?	⦿ <i>Yes</i>	
n How do they make us sick?	⦿ <i>Live & reproduce in our bodies (but outside of our cells). Produce toxins & wastes.</i>	

Pathogen Comparison

Virus

n <i>Examples:</i>	Colds, flu, HIV, herpes, hepatitis
n <i>Are they living?</i>	⦿ <i>NOT cells. Contain DNA or RNA in a protein shell. Tiny.</i>
n <i>Can they reproduce?</i>	⦿ <i>Not without a host</i>
n <i>Do <u>antibiotics</u> work?</i>	⦿ No
n <i>How do they make us sick?</i>	⦿ <i>Get inside of cells. Reproduce there using the cell's machinery.</i> ⦿ <i>Host cell bursts & releases copies of virus.</i>

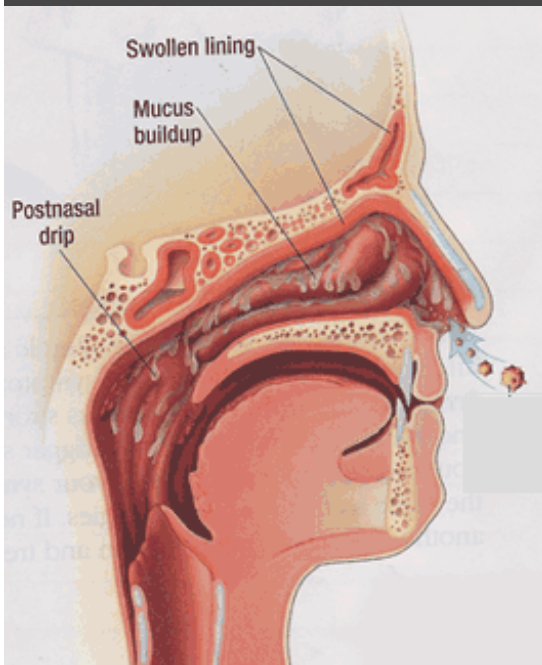
Immune Defenses

1. Nonspecific Defenses: physical barriers against pathogens.

→ *Analogy: These defenses are like a wall around a fortress.*

◎ The 1st line of defense includes:

- Skin, Tears, Mucus, Sweat



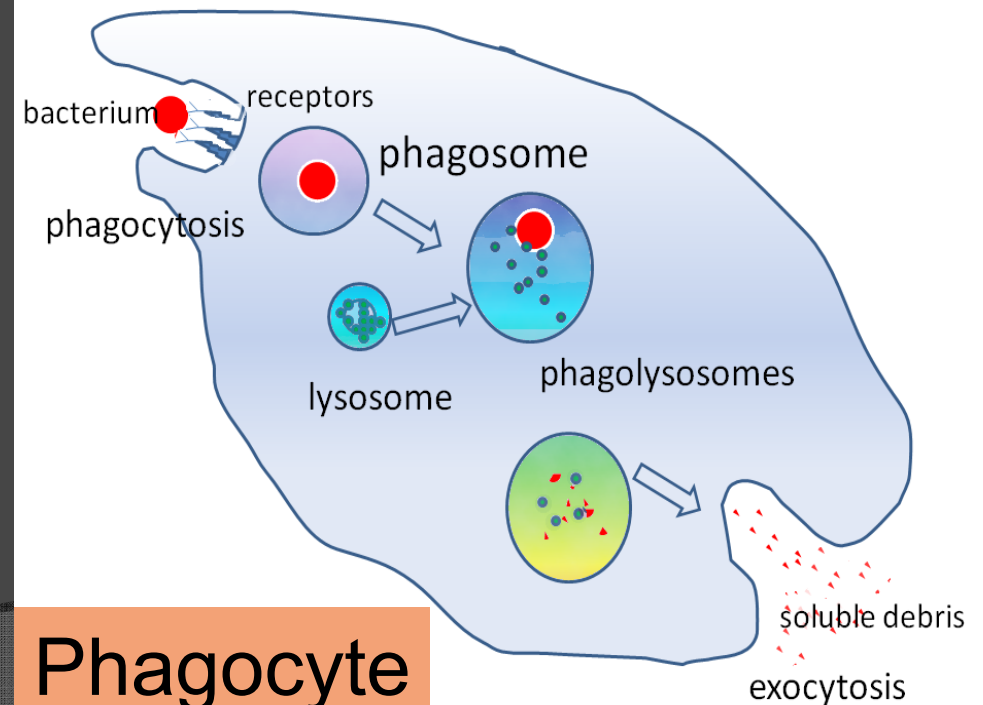
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1. Nonspecific Defenses (continued):

If pathogens get through a break in the skin we have a...

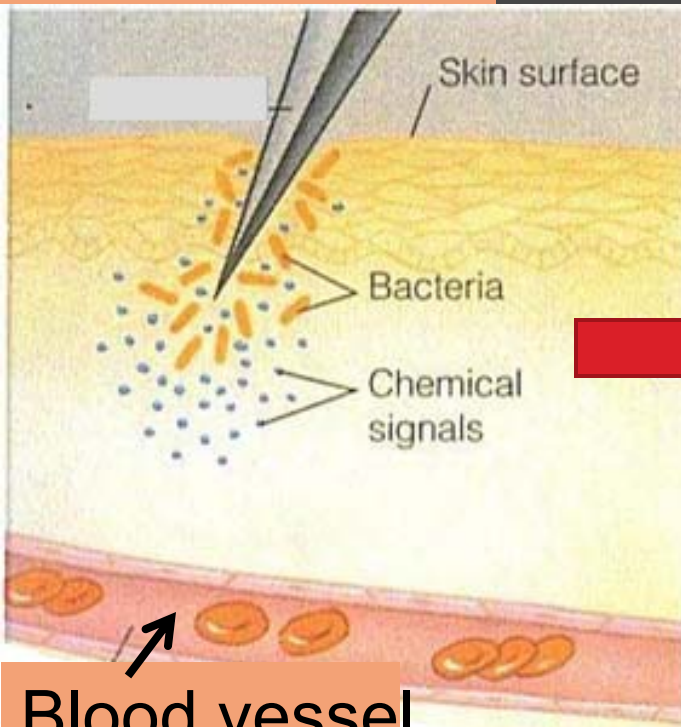
○ 2nd line of defense – **Inflammatory Response:**

- **Phagocytes** (type of white blood cell) invade area, engulf (eat), & destroy the pathogens.
 - Ex: macrophage
- Other symptoms: swollen tissue, pain

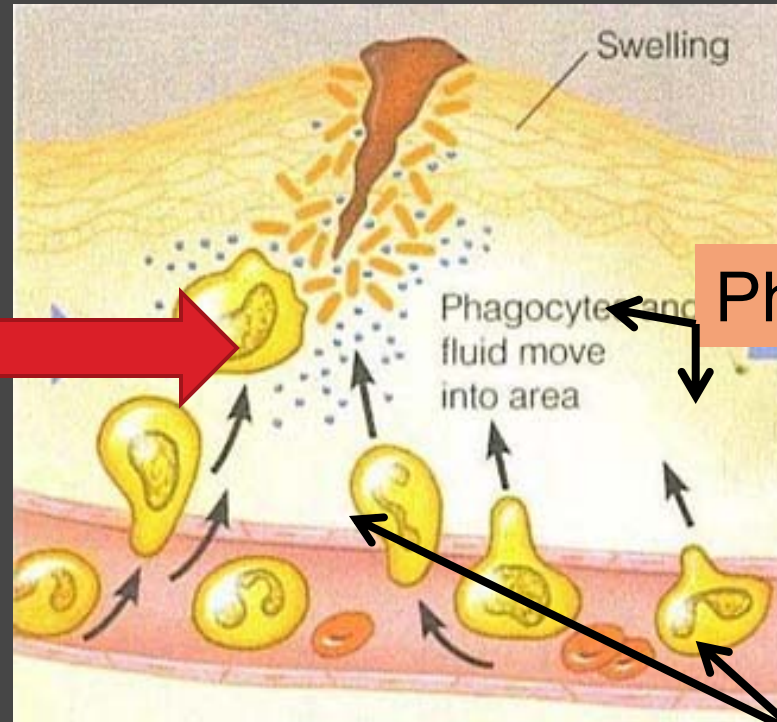


Inflammatory Response

Pin w/bacteria



Blood vessel



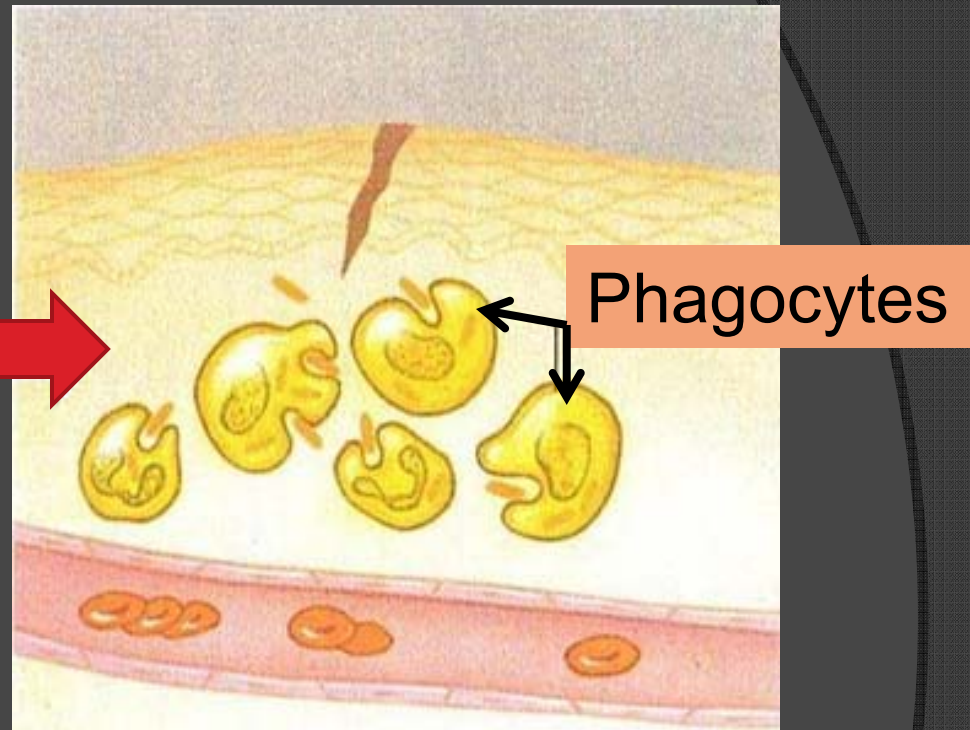
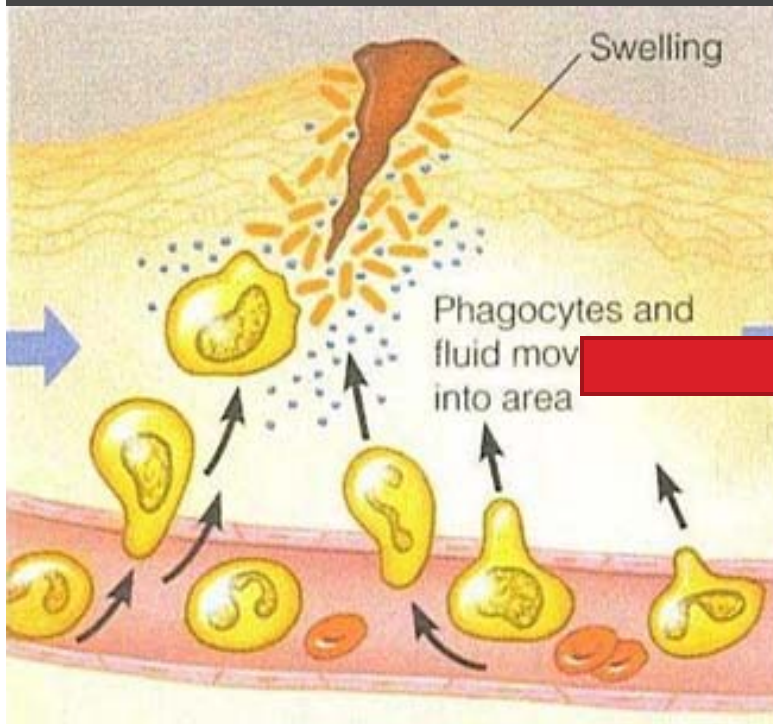
Phagocytes

Phagocyte

1. Pin with bacteria breaks skin - chemical signals are released.

2. Phagocytes receive signal & leak into the infected area. Swelling & pain.

Inflammatory Response



2. Phagocytes receive signal & leak into the infected area. Swelling & pain.

3. Phagocytes (macrophages & others) eat bacteria. Tissue heals.