

# **THE BODY'S DEFENSES**

**USMONOV ILKHAMJON**

# The Nature of Disease – Kasallik tabiati

- Pathogenic Organisms – patogen organizmlar
- Genetic Disorders – genetik buzilishlar
- Toxic Chemicals – kimyoviy toksik moddalar
- Other Environmental Factors – boshqa atrof muhit omillari
- Physical Damage to Organs – organlarga fizik zararlar
- Nutritional Disorders – ovqatlanish buzilishlari

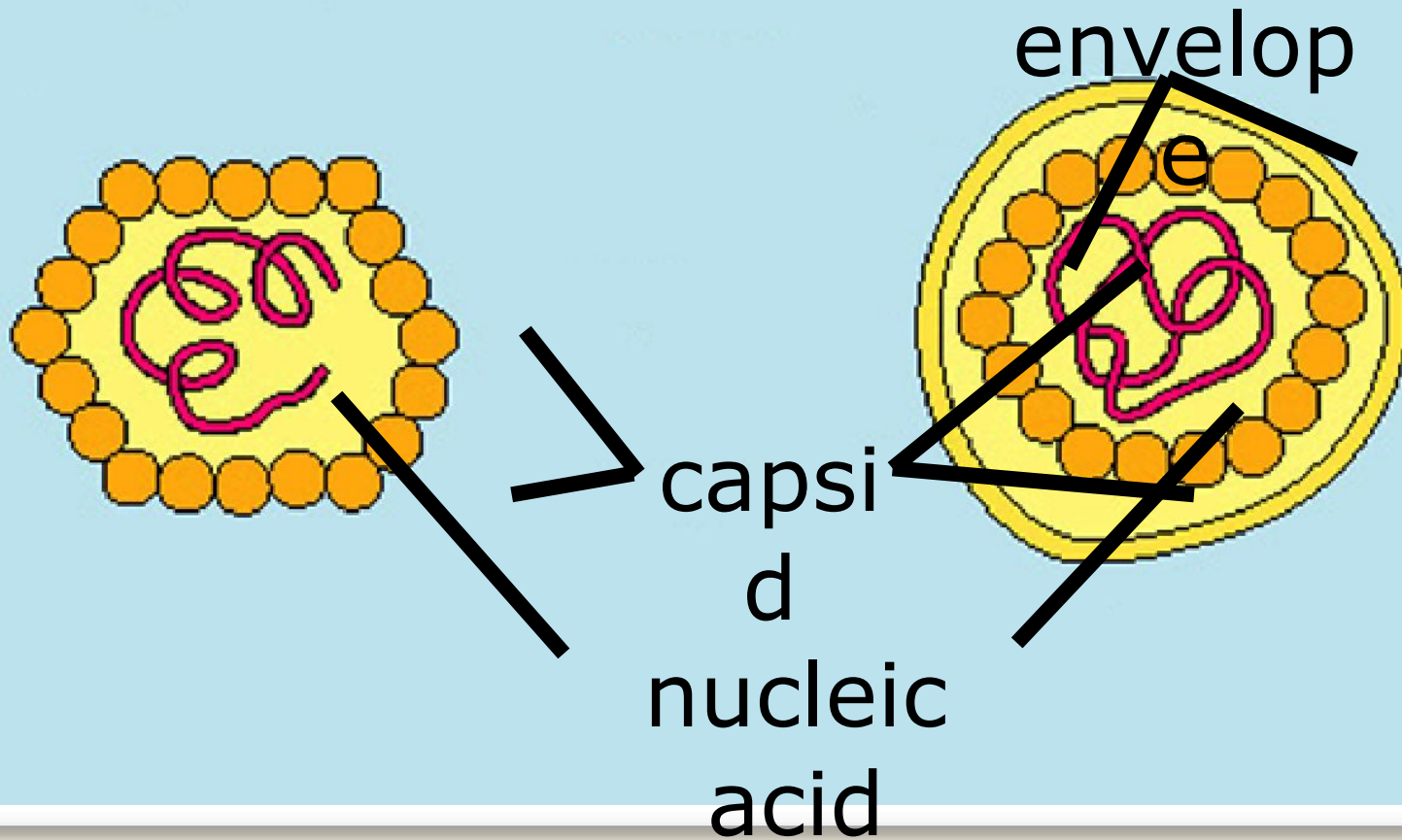
## Types of Pathogenic Organisms – patogen organizmlar tiplari

- Viruses - viruslar
- Bacteria – bakteriyalar
- Fungi – zamburug'lar
- Animal - hayvonlar
- Parasites - parazitlar

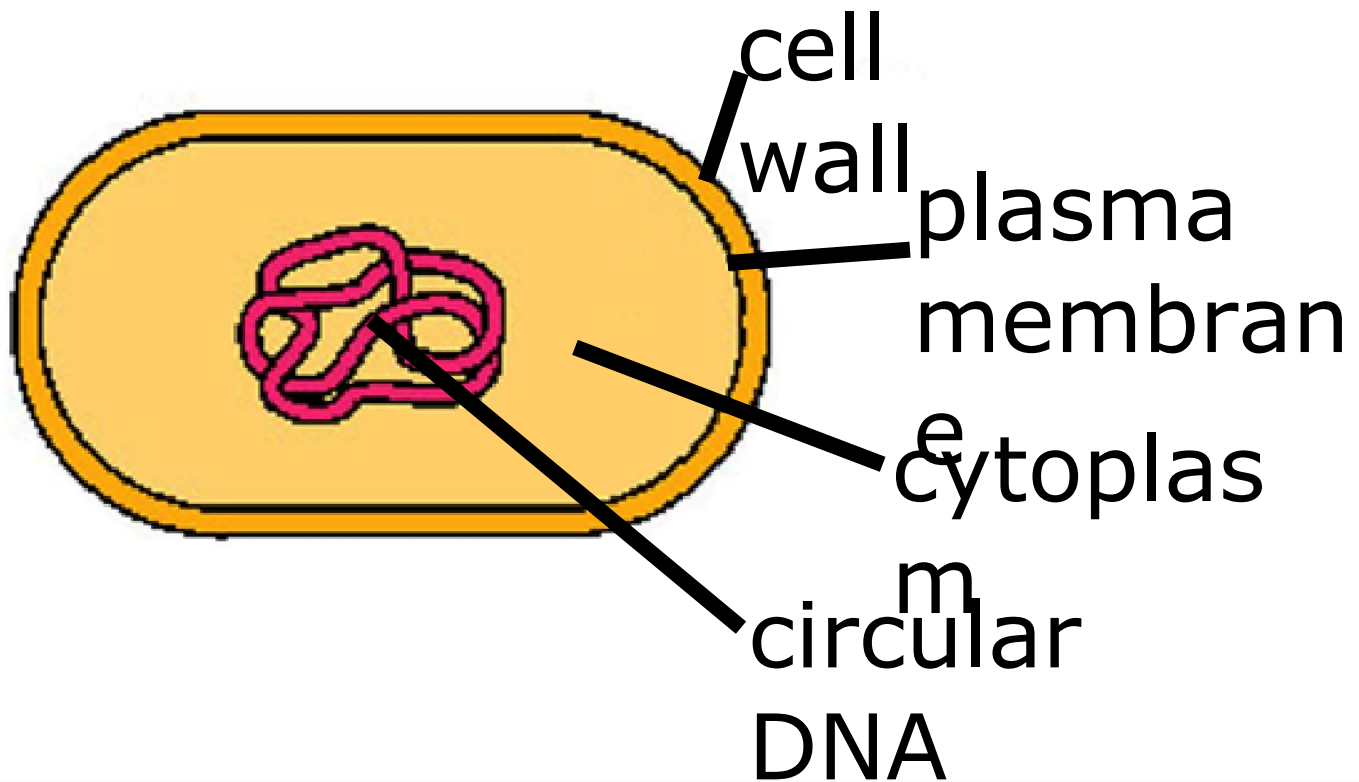
# **Mechanisms of Disease by Pathogens – patogen kasalliklar mexanizmlari**

- Utilization of host nutritional resources
- Physical damage to host tissues
- Production of toxic substances
- Chromosomal and gene damage

# Viruses - viruslar



# Bacteria



# Defense Mechanisms – himoya mexanizmlari

1. External defense – tashqi himoya
2. Internal Defense – oraliq himoya
3. Immune Defense – immun himoya

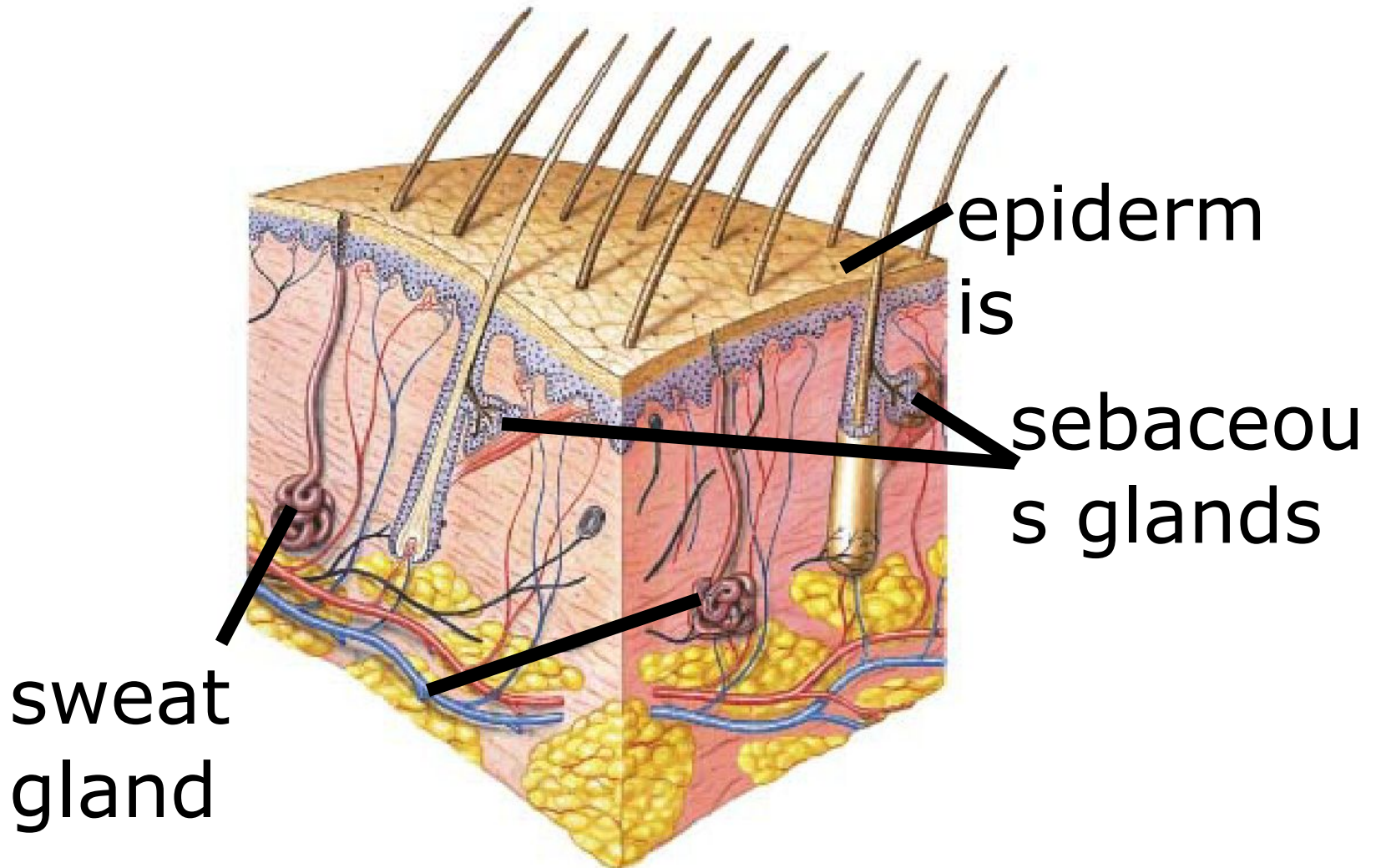
Nonspecific defense mechanisms		Specific defense mechanisms (immune system)
First line of defense	Second line of defense	Third line of defense
<ul style="list-style-type: none"><li>• Skin</li><li>• Mucous membranes</li><li>• Secretions of skin and mucous membranes</li></ul>	<ul style="list-style-type: none"><li>• Phagocytic white blood cells</li><li>• Antimicrobial proteins</li><li>• The inflammatory response</li></ul>	<ul style="list-style-type: none"><li>• Lymphocytes</li><li>• Antibodies</li></ul>

# 1<sup>st</sup> Line of Defense

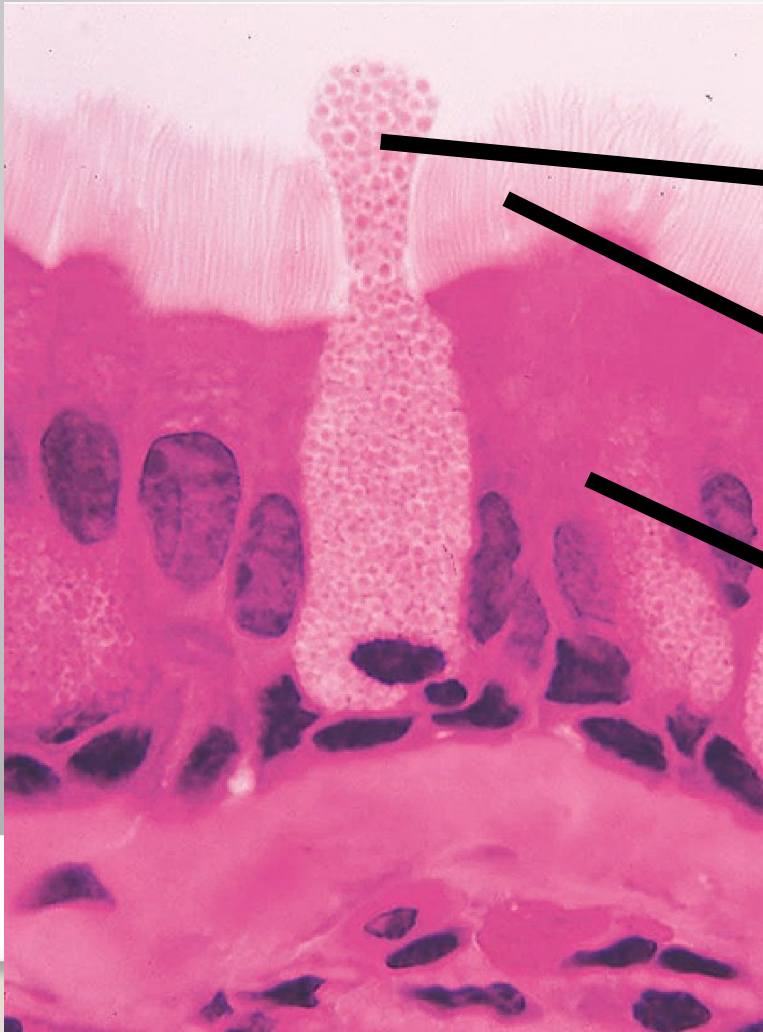
- Skin acts as barrier to microbes and viruses
  - sweat has a low pH - Teri mikrob va viruslarni to'sadi – past pH muhitga ega
- Mucus traps foreign particles - muguz tashqi zarrachalardan to'sadi
- Tears
  - Lysozyme has antimicrobial action – so'lak tarkibidagi lizotsim antibakterial tasirga ega
- Gastric stomach acid – oshqozon kislotasi HCl



# Body Coverings: The Skin



# Body Coverings: Mucous Membranes



mucu

s

cili

a

columnar

epitheliu

m

# 2<sup>nd</sup> Line of Defense

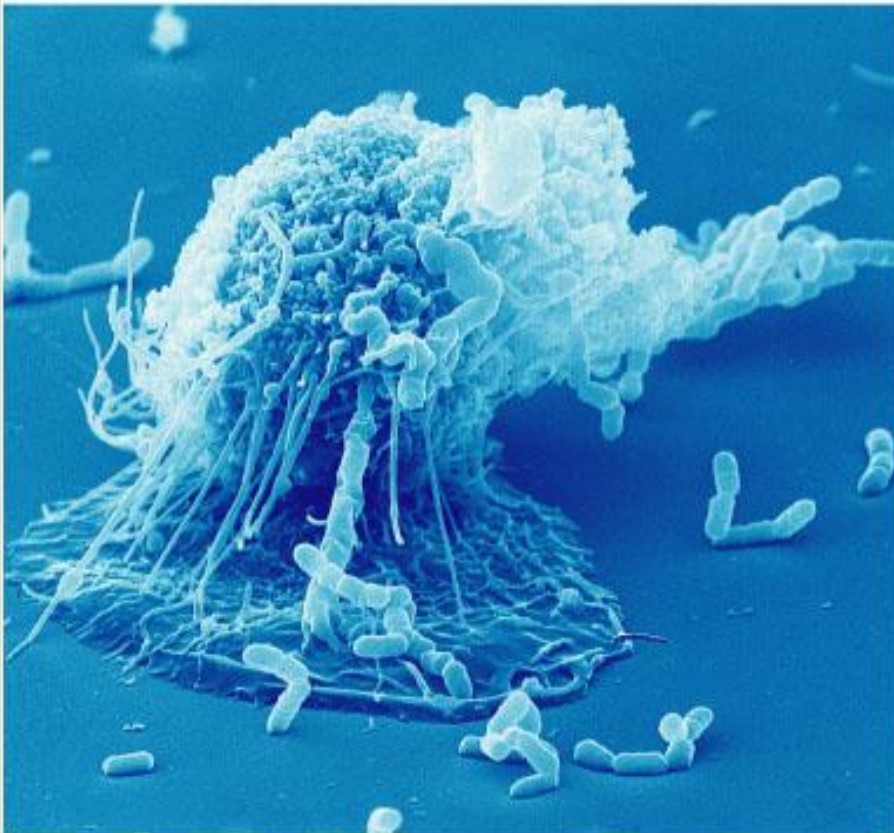
- Phagocytic cells (WBCs)
  - N L M E B
  - Natural Killer (NK) Cells: attack virus infected cells
- Inflammatory Response
- Antimicrobial proteins
  - Lysozyme
  - Interferon
  - Antibodies

# Nonspecific Phagocytosis



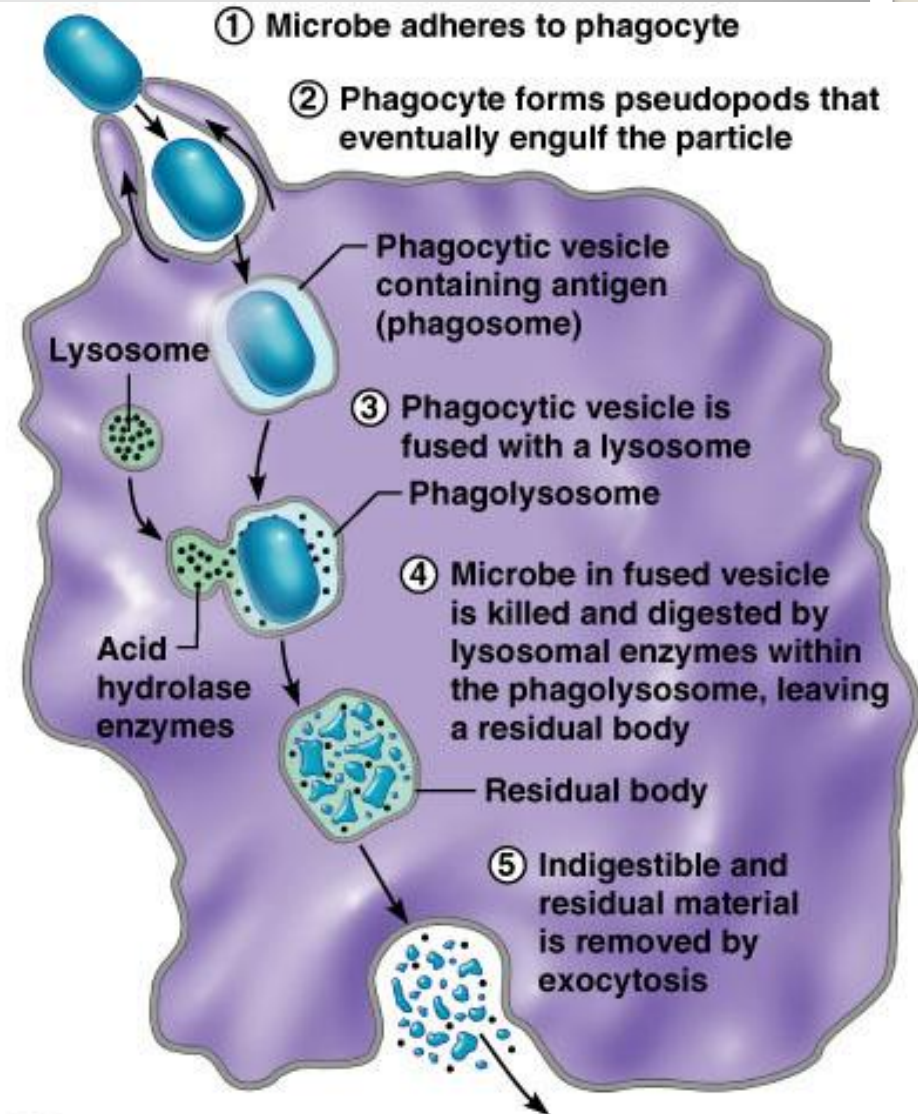
**Neutrophils**  
**Monocytes**  
**Eosinophils**

# Mechanism of Phagocytosis



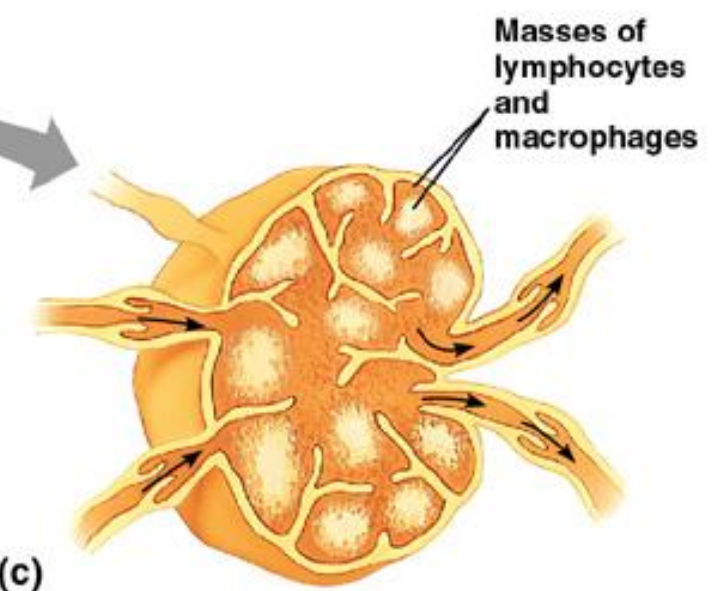
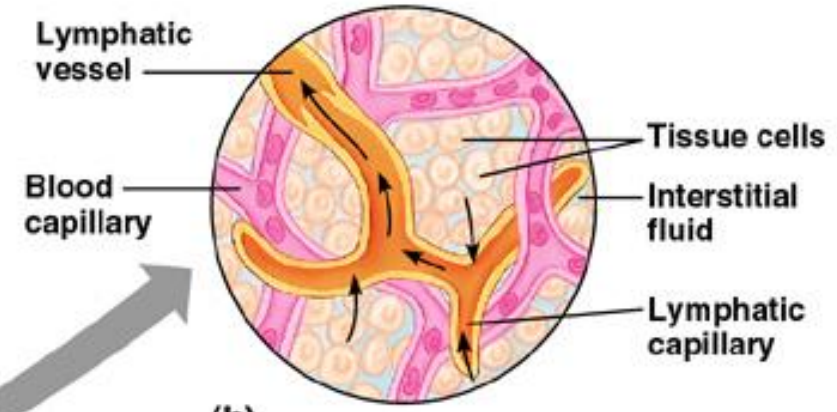
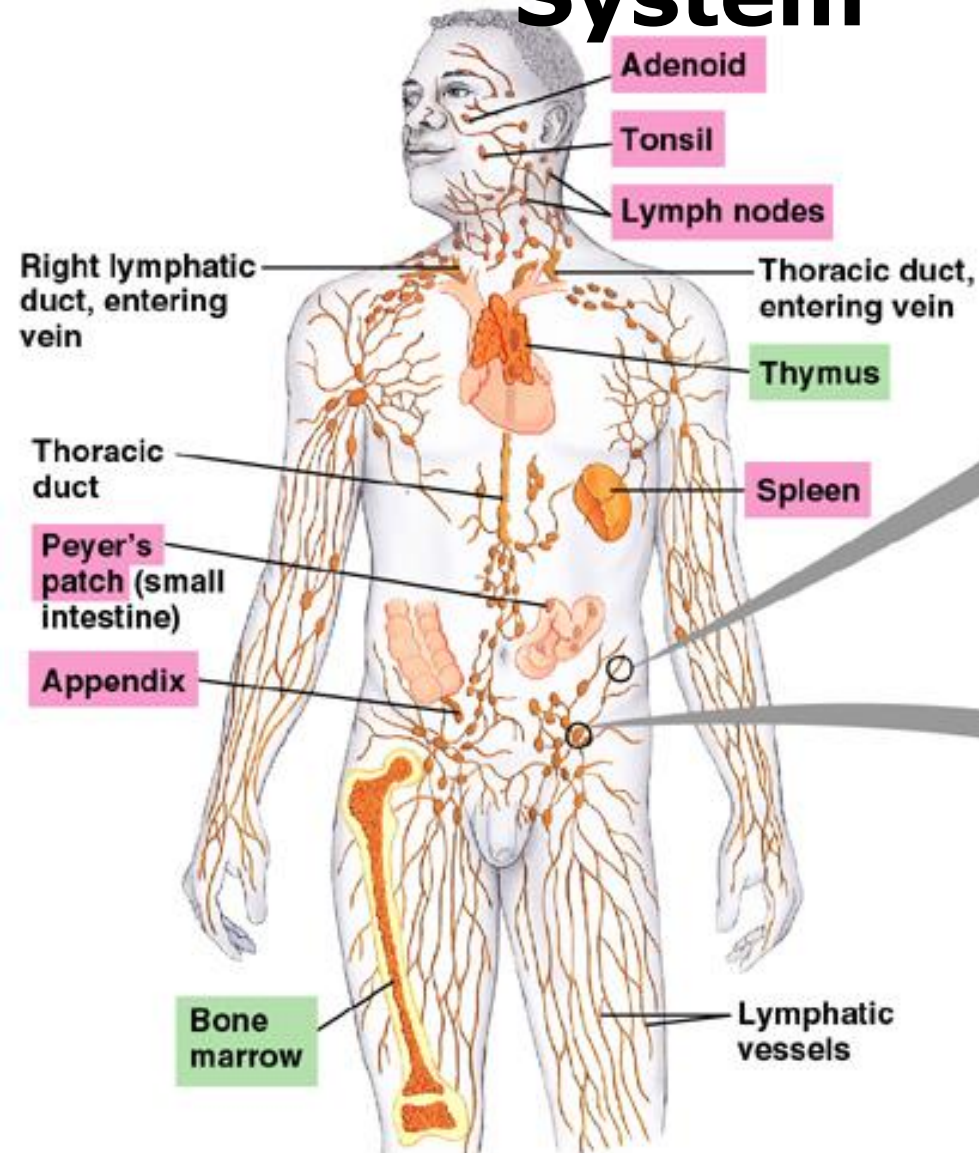
(a)

**Macrophage**



(b)

# Lymphatic System

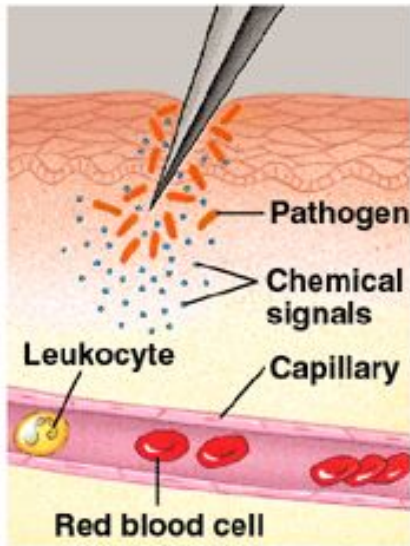


(a)

(b)

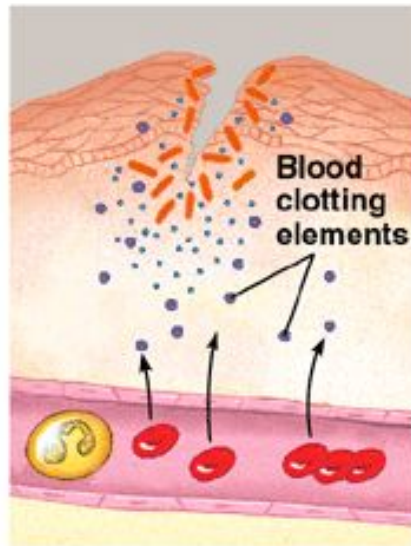
(c)

# Inflammatory Response



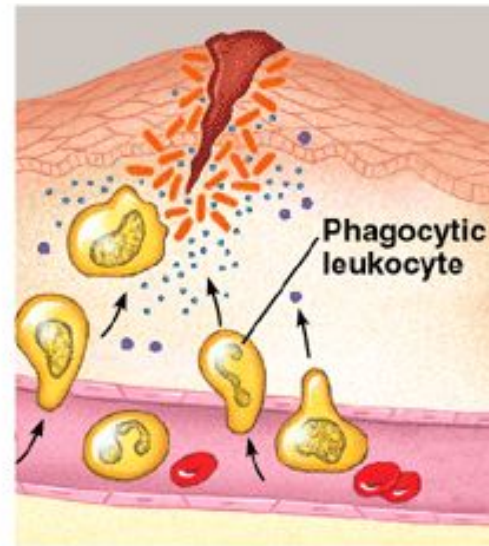
1

Histamine & prostaglandins released



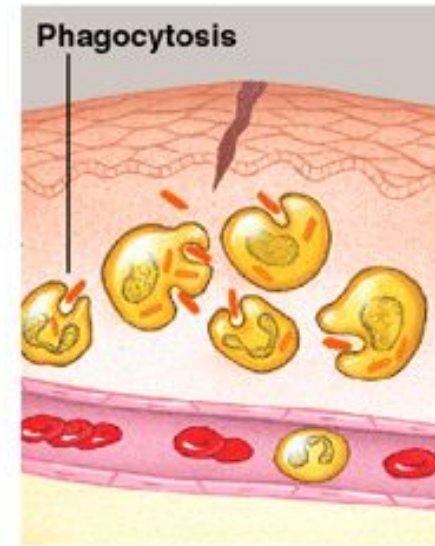
2

Capillaries dilate  
Clotting begins



3

Chemotactic factors attract phagocytic cells



4

Phagocytes consume pathogens & cell debris

# Characteristics of Immunity

- Recognition of self versus non-self – o'ziga tegishli bo'lmagan antigenni tanish
- Response is specific – unga muayyan javob qaytarish
- Retains a "memory" allowing an accelerated second response – tezashtirilgan ikkinchi javob berishga imkon beruvchi "xotira" saqlanadi
- Can respond to many different materials – turli xil materiallarga javob beradi
- Involves lymphocytes and antibodies – limfotsitlar va antitanalarni o'z ichiga oladi



# Types of Immunity

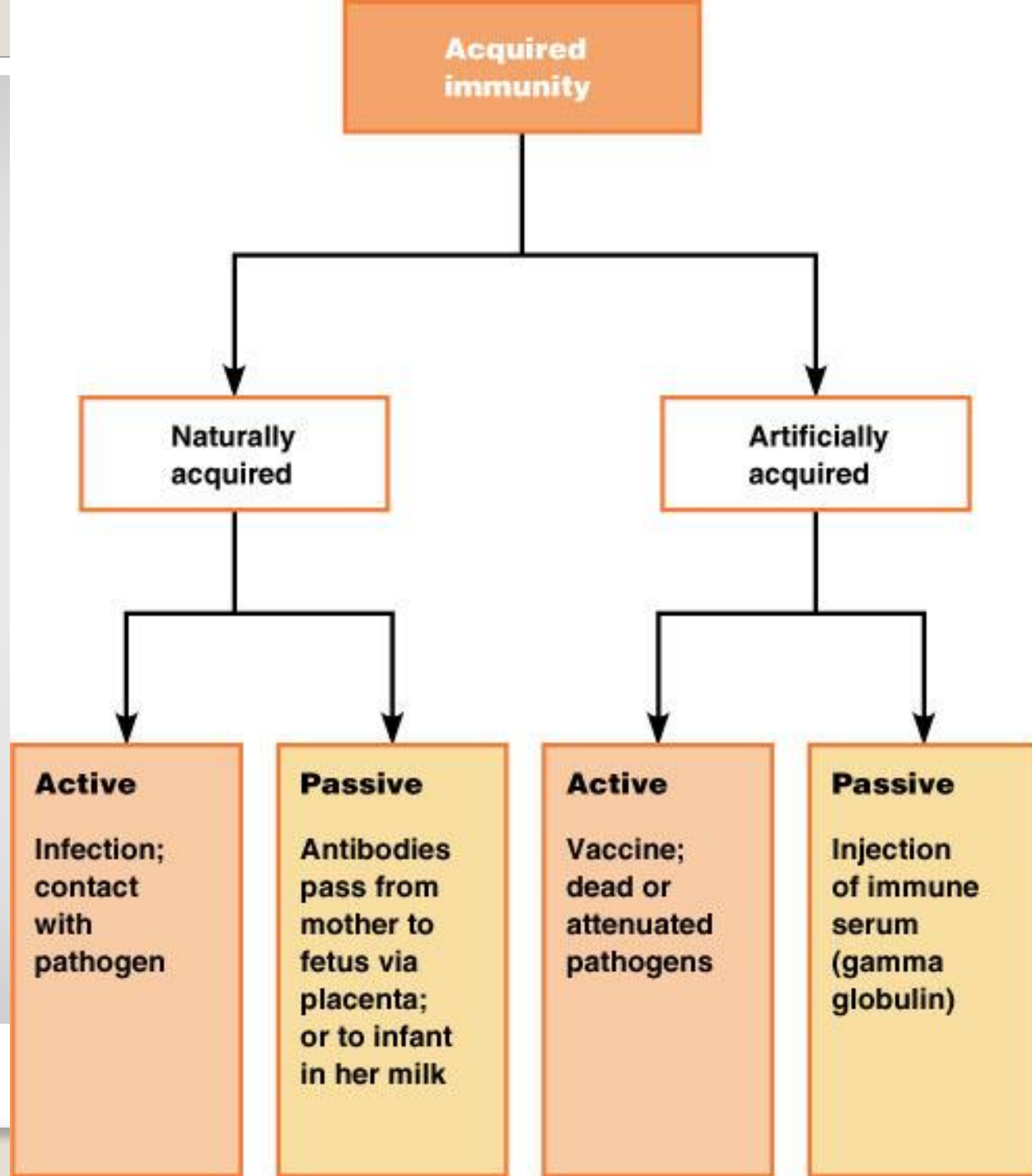
- **Active Immunity**

- Naturally-Acquired Active Immunity – tabiiy aktiv
- Artificially-Acquired Active Immunity – sun'iy aktiv

- **Passive Immunity**

- Naturally-Acquired Passive Immunity – tabiiy passiv
- Artificially-Acquired Passive Immunity – sun'iy passiv

# Types of Acquired Immunity



**Thank you !!!**