

Chapter 40-2: The Immune System

Essential Questions:

- What are the body's ***non-specific defenses*** against invading pathogens?
 - What is ***immunity***?
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- Non-specific defenses

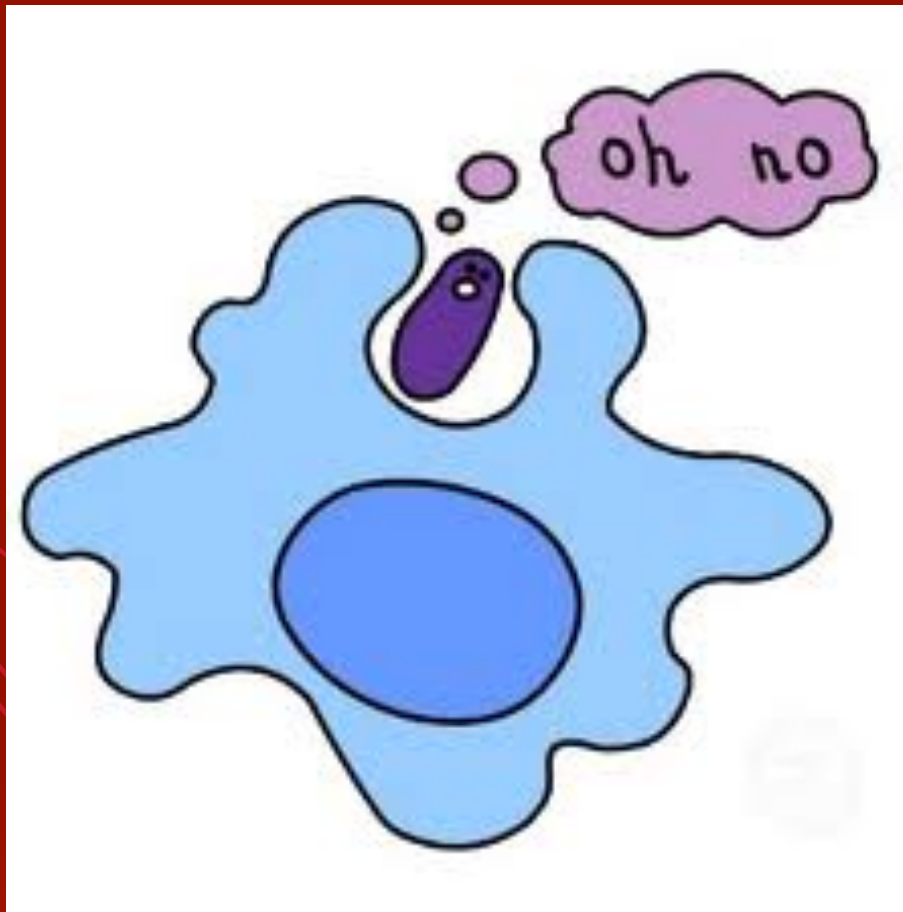
- Like fortress walls – keep everything out

- First line of defense

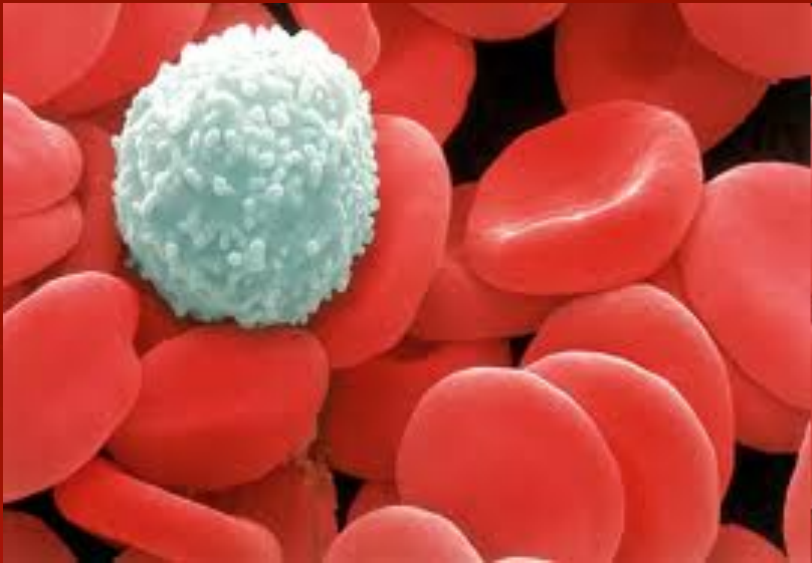
- Skin
- Mucus
- Sweat
- Tears



- Second line of defense
 - Inflammatory response
 - White blood cells
 - Phagocytes



- White blood cells (WBC) produced when pathogens detected
- Fever
- Interferon



- Specific defenses (immune response)
 - *Antigen*

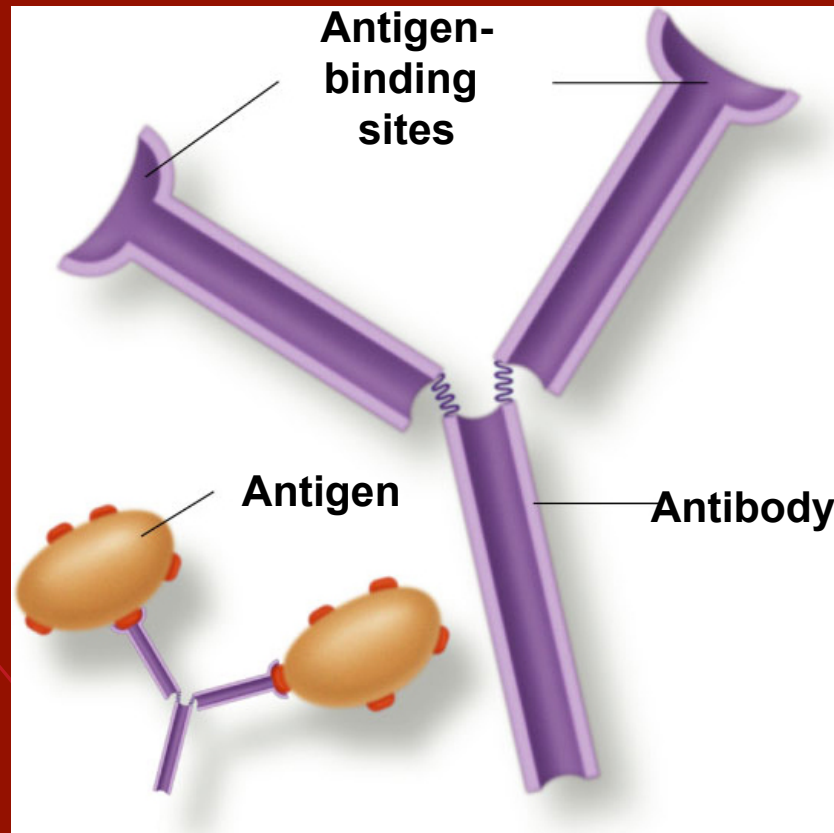


- Humoral immunity – in body fluids
 - B cells produce *antibodies*
 - Each B cell capable of producing slightly different antibody
 - T cells (helper cells)

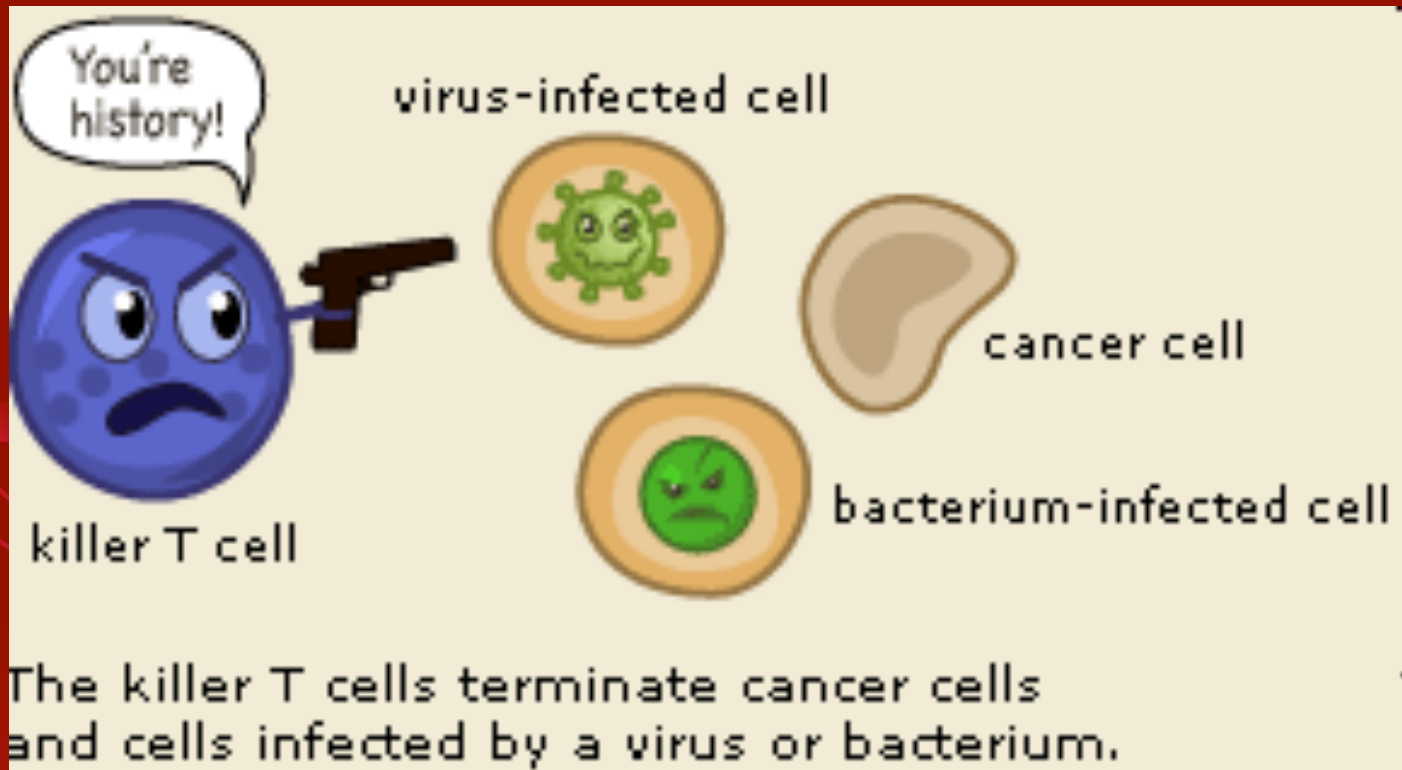


Figure 40–8 Structure of an Antibody

Section 40-2

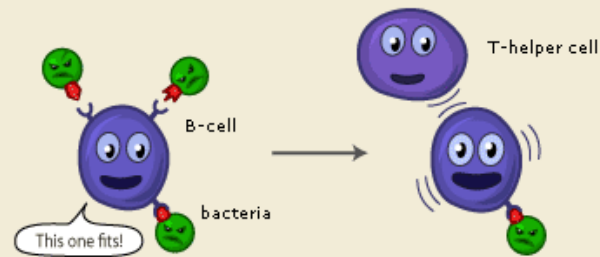


- Cell-mediated immunity – w/out antibodies
 - “killer T” cells
 - Marker proteins
 - Makes organ transplants difficult



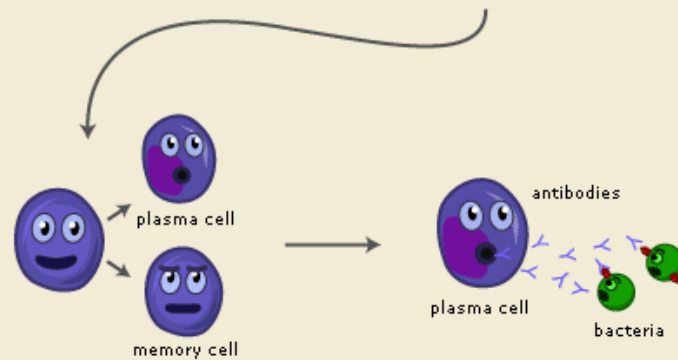
- Permanent immunity
 - *Memory B & T cells*





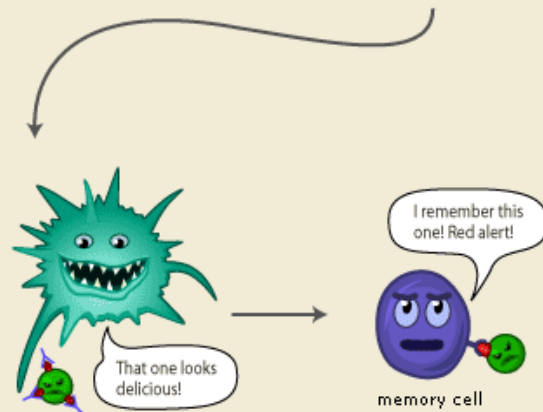
1. The B-cell finds an antigen which matches its receptors.

2. It waits until it is activated by a T-helper cell.



3. Then the B-cell divides to produce plasma and memory cells.

4. Plasma cells produce antibodies that attach to the current type of invader.



5. "Eater cells," prefer intruders marked with antibodies and "eats" loads of them.

6. If the same intruder invades again, memory cells help to activate the immune system to activate much faster.

- Active immunity
 - *Vaccination*



- **Passive immunity**

- Antibodies for pathogen from other animals put into bloodstream
- Maternal immunity

