Anatomy & Physiology: THE IMMUNE SYSTEM

▶ The **immune system** protects the body from infection by bacteria, viruses, and parasites.

Terms

adaptive immune system: specifically targets pathogens and attacks them based on their specific properties

antibodies: proteins that bind to the antigen to neutralize it and stimulate phagocytes to ingest the entire structure

antigens: substances unrecognized by the immune system that exist on the surface of pathogenic cells

antimicrobial peptides: interfere with membrane and DNA function of bacteria, destroying it

B cells: stimulated by helper T cells; produce antibodies for an antibody-mediated response

cell-mediated response: destruction of infected cells by cytotoxic T cells

cytotoxic T cells: actively destroy infected cells by binding to the targeted cell's surface

earwax: bars pathogens from entry at the ears

helper T cells: a type of T cell that binds to the antigen under attack by the immune system

immune response: series of events triggered when antigens are detected by the immune system

immunity: resistance to a pathogen following an antibody-mediated response

inflammation response: release of histamines around injured body tissue to raise the temperature and increase blood flow into the area, bringing more white blood cells to the tissue for repair

innate immune system: nonspecific defenses including physical barriers as well as specific cells that attack invaders that penetrate these barriers

interferon: released by infected cells; causes nearby cells to increase their defenses

leukocytes: white blood cells

lymphocytes: two distinct kinds of white blood cells (T and B cells)

memory cells: a type of B cell that stores information for producing the antibody; activated when the same antigen appears in the body

mucus: traps pathogens before they can replicate and infect

natural killer lymphocytes: respond to virus-infected cells; can recognize damaged cells with the presence of antibodies; part of early defense against bacterial infection

neutrophils: leukocytes that destroy invaders

pathogens: any foreign substances that cause disease or infection; include viruses, bacteria, and fungi

phagocytes: specialized white blood cells that can engulf portions of or entire pathogens

plasma cells: a type of B cell that produces antibodies

skin: organ that surrounds the entire body, leaving few openings for an infection-causing agent to enter

T cells: antigen-detecting lymphocytes

white blood cells: specialized blood cells that attack pathogens

Lines of Defense in the Immune System

1. external barriers	skin, enzymes, mucus, earwax, native bacteria
2. the innate response	inflammation, eukocytes (white blood cells), antimicrobial peptides, natural killer lymphocytes, interferon
3. the adaptive response	helper T cells, cytotoxic T cells, B cells, memory B cells

Types of White Blood Cells