The Human Immune System

- The body's defense against disease causing organisms, malfunctioning cells, and foreign particles
- A collections of cells, tissues, and organs that fight disease-causing agents

Lines of Defense

- First line of Defense skin
 - Lining of stomach and intestines
 - Lining of nose eyes and ears
 - Secretations
- The dead, outer layer of skin, known as the **epidermis**, forms a shield against invaders and secretes chemicals that kill potential invaders

White Blood Cells	Blood cells that protect the body against pathogens (bacteria/virus)
Phagocytes	A cell that ingests (eats) and destroys bacteria and other foreign particles
Interferon	Play a role in the 1 line of defense It that helps to stop virus from reproducing. Boosts immune system
T-Cells	Type of white blood cell. "Soldiers" Adapts to pathogens and destroys them
Inflammatory Response	Defense reaction of the body to invasion by a foreign substance/organism; involves WBC, pus, increase in temp.

- You shed between 40 50 thousand skin cells every day!
- Destroy pathogens (bacteria, viruses)

The Second Line of Defense

- The thymus and spleen release WBCs into the blood.
 - The spleen also filters the blood. It recycles the old, run down red blood cells some parts are reused.
 - White blood cells

Body temperature

Inflammation- because more blood is flowing to a certain area

Specific Immunity

- Antigens are molecules that are foreign to your body
- Antibody is a protein that is made in response to a specific antigen
 - Antibody attaches to a specific antigen and makes it useless.
 - Protein made by the body that makes the antigen so that is useless or can be destroyed by a lymphocyte.
- Active your body makes its own antibodies
 - You produce the antibodies
 - Your body has been exposed to the antigen in the past either through:
 - Exposure to the actual disease causing antigen You fought it, you won, you remember
 it
 - Planned exposure to a form of the antigen that has been killed or weakened You detected it, eliminated it, and remember it
 - Vaccine
 - Antigen that is injected or taken orally into the body so that the body can build up antibodies to destroy the pathogen.
 - A booster vaccine is to keep your antibody #s up.
 - Example would be a tetanus
- Passive when antibodies are produced in another organism are introduced into your body to help destroy the antigens.
 - You <u>don't</u> produce the antibodies
 - A mother will pass immunities on to her baby during pregnancy through placenta?
 - These antibodies will protect the baby for a short period of time following birth while its immune system develops. What endocrine gland is responsible for this?
 - Lasts until antibodies die
- Protecting against disease
 - Heat (pasteurize)
 - Chemicals

- Radiation
- Water

How disease spreads

- By coming in contact with the pathogen
- As you breathe in, foreign particles and bacteria bump into mucus throughout your respiratory system and become stuck
- · Hair-like structures called cilia sweep this mucus into the throat for coughing or swallowing
- Swallowed bacteria are broken down by incredibly strong acids in the stomach that break down your food
- The stomach must produce a coating of special mucus or this acid would eat through the stomach!

How does our body keep viruses and bacteria out?

- Examples include:
- Skin, tears, earwax, saliva, gastric juice, mucus, cilia
- how might each of these keep out the invaders?
- What do you think this is?

Escherichia coli (E. coli)

is common and plentiful in all of our digestive tracts. Why are we all not sick?

Immune Disorders

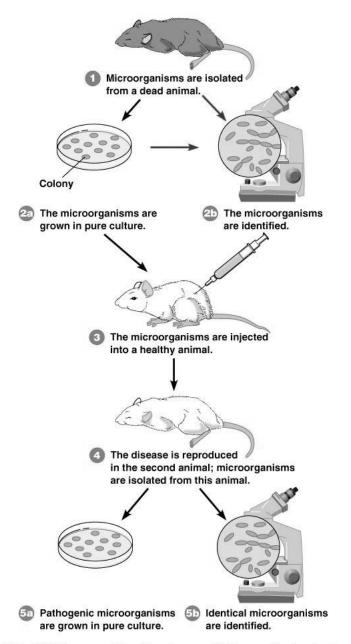
~Allergies~

- Immune system mistakenly recognizes harmless foreign particles as serious threats
- Launches immune response, which causes sneezing, runny nose, and watery eyes
- o Anti-histamines block effect of histamines and bring relief to allergy sufferers
- Aguired Immune Deficiency Syndrome
 - o Caused by the Human Immunodeficiency Virus
 - o Discovered in 1983
 - Specifically targets and kills T-cells
 - o Because normal body cells are unaffected, immune response is not launched
 - The HIV virus doesn't kill you it cripples your immune system
 - With your immune system shut down, common diseases that your immune system normally could defeat become life-threatening
 - o Can show no effects for several months all the way up to 10 years

• Koch's Postulates

- o 1. Microorganisms are isolated from dead animals
- o 2. Microorganisms are grown in pure culture
- 2b. Microorganisms are identified

- o 3. Microorganisms are injected into healthy animals
- o 4. Disease is reproduced in second animal
- o 5. Microorganisms are grown in pure culture
- o 5b. Identification of identical microorganism.



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