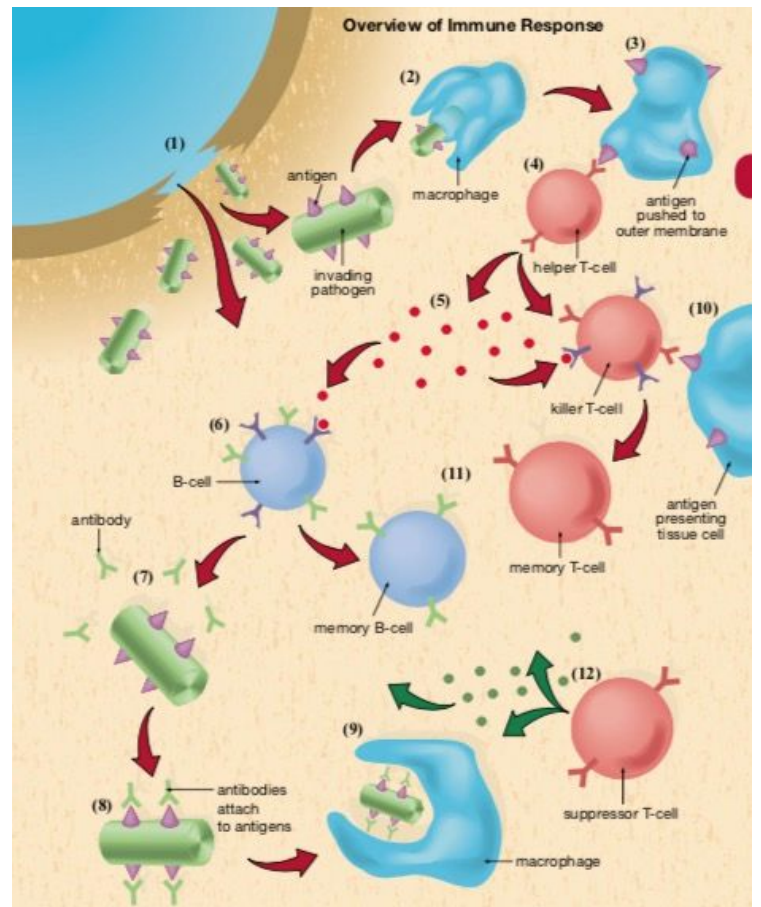


The Immune Response

- 1) Pathogen Enters the Body
 - a) Through a break in the skin
 - b) Each pathogen has its own set of antigens (proteins that line the outside of the pathogen)
- 2) Macrophages (white blood cells) engulf the pathogen
- 3) Macrophages destroy the pathogen and present the pathogen's antigens
- 4) Helper T cells (other WBCs) work to identify the foreign antigens.
- 5) If identified as an invader the body has seen before, the Helper T cells will release specific chemical messengers to other immune cells to coordinate their efforts on the best way to beat it.
- 6) B Cells that have been made for this exact invader are alerted by the chemical message and start making and releasing antibodies
 - a) If the pathogen is in a regular body cell, Killer T cells will be alerted to the area to kill those body cells by "popping" them
- 7) Antibodies help by binding to the antigens on the pathogens body, incapacitating them but making them clump up, and identifying them for clean up
- 8) If this is a first infection the body will make memory B Cells and T cells to keep around for faster activation against this pathogen
- 9) Once everything is over, Suppressor T cells will activate the immune system to go back to normal.



Vaccinations

- Artificial immunity
- Using dead or incapacitated pathogens to help the body produce Memory T Cells, for that particular antigen.
- Depending on the vaccine and it's delivery can completely eradicate a pathogen
- Antigens can be given directly to a patient as well, but antigens don't produce Memory T Cells and well soon die out

- Developed by Edward Jenner in 1796, smallpox vs. cowpox

Vaccination (injection), Inoculation (through a cut)

These antigens can come from breast milk (breastfeeding mothers, natural) or from injections (like the ebola virus, artificial)

Autoimmune Diseases

- When the body makes immune cells that attack healthy body tissue

Rheumatoid arthritis - WCBs attacking joints and bones
Multiple sclerosis (MS) - WCBs attack the nervous system
Type 1 Diabetes - WCBs attack the pancreas.

Science 30 - Lesson 8 - The Immune Response

Name: _____

- 1) Explain how an autoimmune disease differs from an infectious disease.

- 2) Write out in your own words a description of how the body reacts to a pathogen.

Be sure to include the following keywords in your description: macrophage, antigens, helper T-cells, B-cells, antibodies, killer T-cells, suppressor T-cells, memory B-cells, and memory T-cells.

- 3) Explain how the following problems impair the body's ability to fight against disease-causing organisms.

- a) Someone who has HIV has many helper T-cells destroyed by the virus.

- 4) Explain how the following methods can be used to assist the body's ability to fight against disease-causing organisms.

- a) vaccinations given at birth

- b) antibiotics prescribed when you have an infection

- c) antiseptics used during operations
