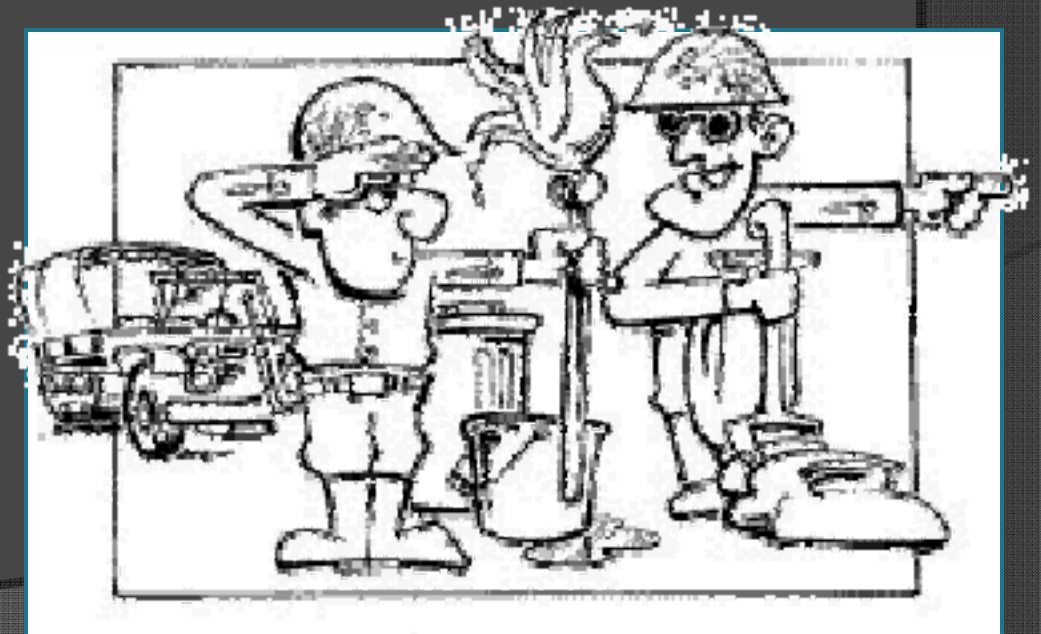


Immune Defenses

2. Specific Defenses:

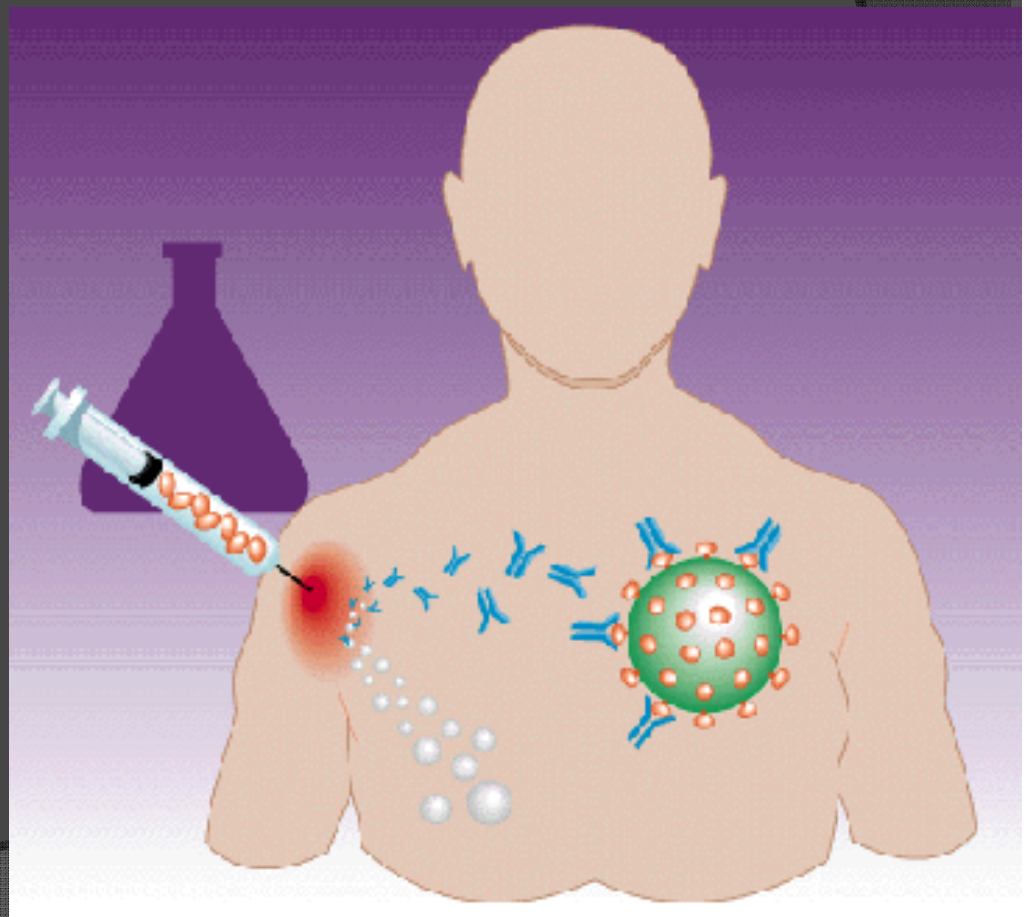
If a pathogen gets past the nonspecific defenses, then... the immune system reacts with a series of **specific defenses that attack the pathogen.**

*Analogy:
These defenses are like the different lines of defense in the Army.*



Vaccines

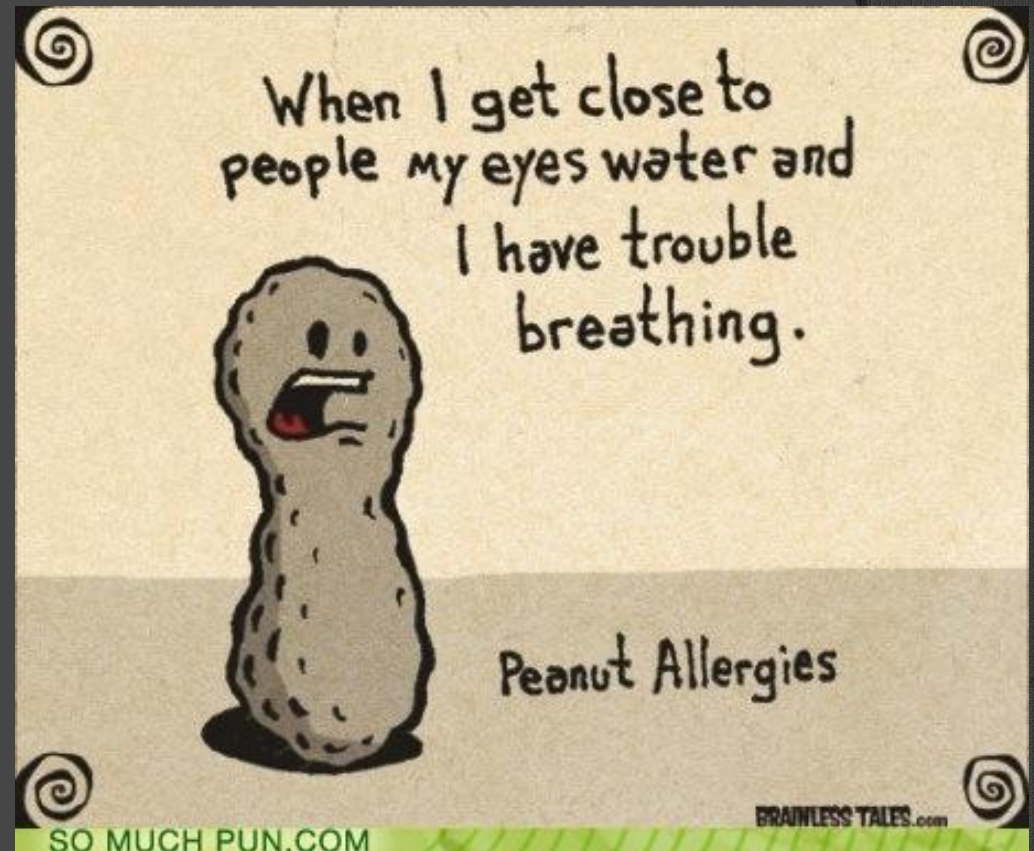
- *What is in the shot they give you?*
 - Vaccines contain antigens or weakened forms of a pathogen.
- *They work by:*
 - Causing B cells to make antibodies against the antigen.



Immune System Disorders

⦿ Allergies

- Immune system overreaction to antigens on foreign substances that are usually harmless



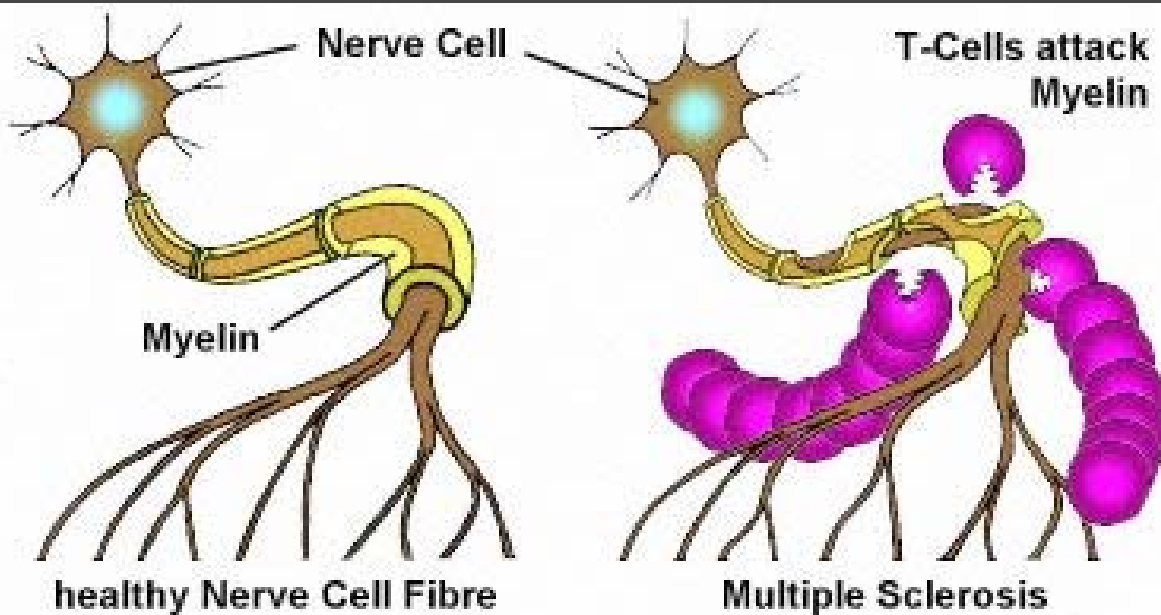
Immune System Disorders

○ Autoimmune Diseases:

- the immune system attacks the cells & tissues of the body.

○ Example:

- multiple sclerosis (MS) - T cells destroy myelin sheath around neurons

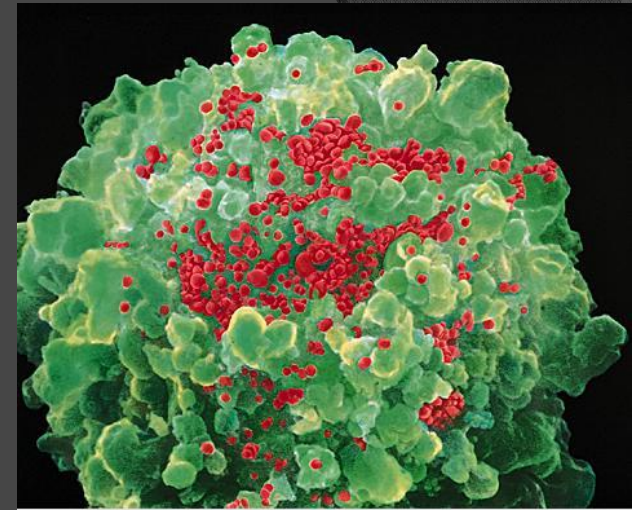


Immune System Disorders

● AIDS

(acquired immune deficiency syndrome):

- Caused by HIV (human immunodeficiency virus)
- HIV weakens the immune system by killing helper T cells
- People with HIV (or AIDS) can easily get illnesses or infections

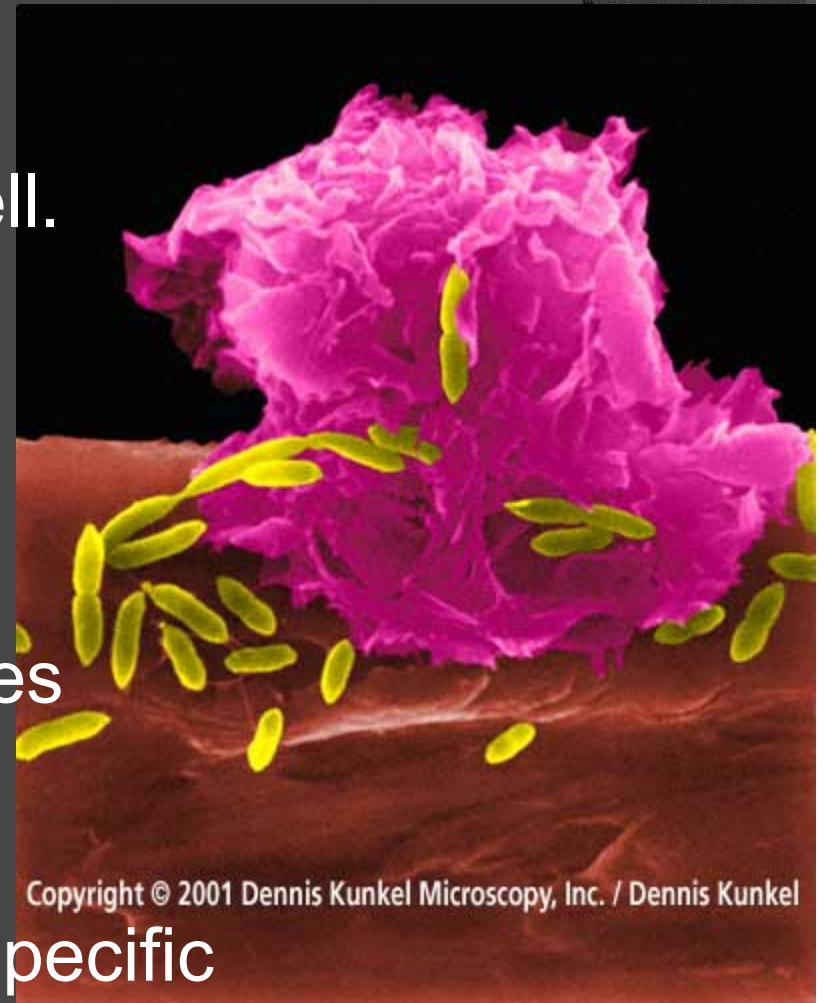


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Jobs of the Immune Cells

- Macrophage (“big eater”)
 - eats pathogens & sticks their antigen on outside of cell.
- Helper T cells
 - Signal to other immune cells to attack certain invaders
- Killer T cells
 - Identify infected cells, attaches to them, & destroys the cell.
- B cells
 - Make antibodies to prevent specific antigens from hurting the body.



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Antibodies vs. Antigens

- Proteins
 - **Recognize** chemical signals from another cell (antigens on a pathogen)
 - Y shape
- Chemical signal on the surface of a pathogen

