

WHAT AND WHERE IS IT?

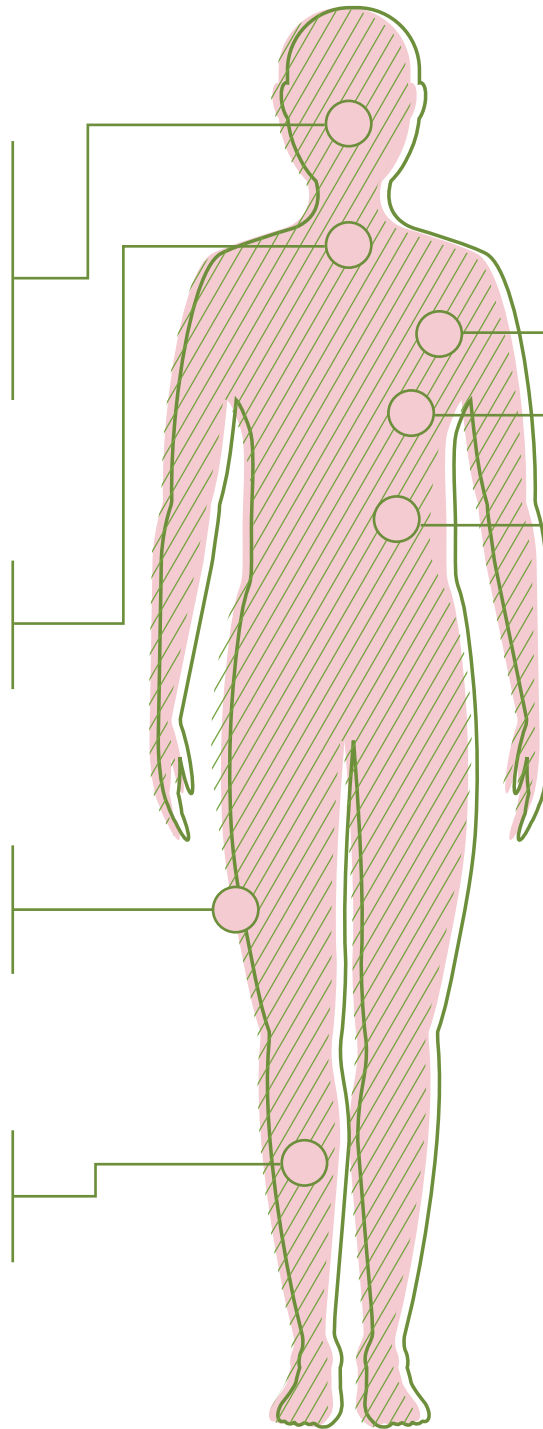
Your immune system is an entire system of cells, tissues, organs, and internal pathways working together to protect you from infections and disease.

Mucous membranes run all the way from your nose and mouth through your trachea (windpipe) and intestines. They produce mucus, a field of sticky snot that traps pathogens. Mucus in your nose and mouth are a first line of defense against airborne pathogens.

The **thymus gland** is where T-cells (a type of white blood cell) mature before specializing into different T-cell types and roles to fight infections.

Your **skin** is the largest organ of your body, and is made up of multiple thick layers of cells that block pathogens from getting in and infecting you.

Bone marrow is where white blood cells are made. These new white blood cells will be trained to attack invading pathogens.



Lymph nodes are clusters of tissue where white blood cells are stored, ready to be dispatched whenever immune system “messenger” cells show up, requesting backup.

Lymphatic vessels run parallel alongside your blood vessels, and use the movement of surrounding muscles to move cellular waste and white blood cells where they need to go throughout your body.

The **spleen** also stores specialized white blood cells (B-cells and T-cells), and filters out old blood cells and antibody-coated bacteria for disposal.

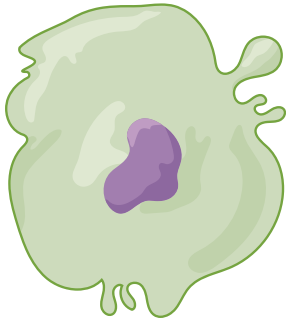


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CELL LINEUP

Your immune system is made up of a lot of hard working cells, all working together to protect you from infection and disease. Here are the stars of your body's defensive lineup.



Macrophage

Macrophages are the first-responder white blood cells at the scene of a possible infection. Macrophages engulf and dissolve pathogens, get rid of dead cells, and send chemical signals to activate additional immune system cells.

Helper T-cell

Helper T-cells are a type of multi-tasking white blood cell that receives identifying information (intel) on invading antigens from dendritic cells. They quickly multiply and take on special roles based on the information they receive.

- Some become long-term Memory T-cells, which remember the new antigen, and then go on patrol to look for invaders.
- Some Helper T-cells head to the lymph nodes to activate and help the B-cells produce the right antibodies to fight the antigen.
- Some Helper Ts become Regulator cells, which head back to the battlefield to direct and call for killer cells.



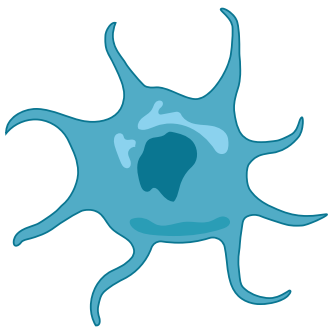
Neutrophil

Neutrophils are the first reinforcements to arrive at a potential infection site. These white blood cells trap and kill invading pathogens so violently, they are programmed to self-destruct after 5 days in order to minimize friendly-fire damage.



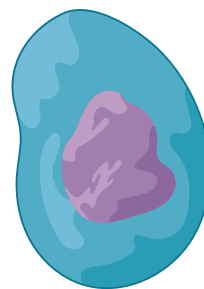
Killer T-cell

Killer T-cells are white blood cells designed to take out a specific, recognized pathogen.



Dendritic Cell

Dendritic cells collect remains of the invading threat (antigens) to analyze, ID, and decide what kind of help is needed next. Information on unfamiliar antigens is shared with Helper T-cells.



B-cell

B-cells are white blood cells that hang out in the lymph nodes and produce antibodies (special proteins that latch onto invading pathogens so they can be destroyed) against specific germs when given instructions from Helper T-cells.



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