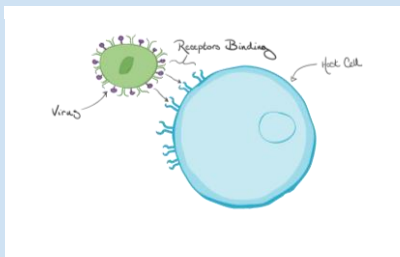


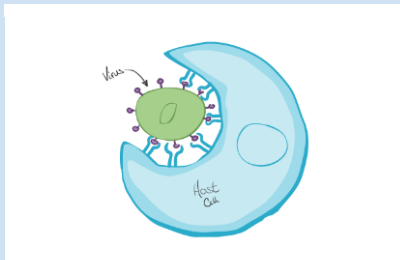
Science V9/S6: Virus/Disease & the Immune System

Phagocytosis

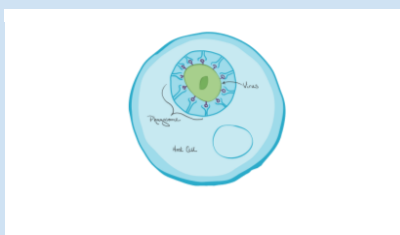
Step 1: The phagocyte approaches the virus. It uses its receptors to attach to the virus.



Step 2: The phagocyte begins engulfing the virus into itself. This does not damage the cell.



Step 3: Once the virus is neutralized, its contents are released in order to communicate with the lymphocytes.



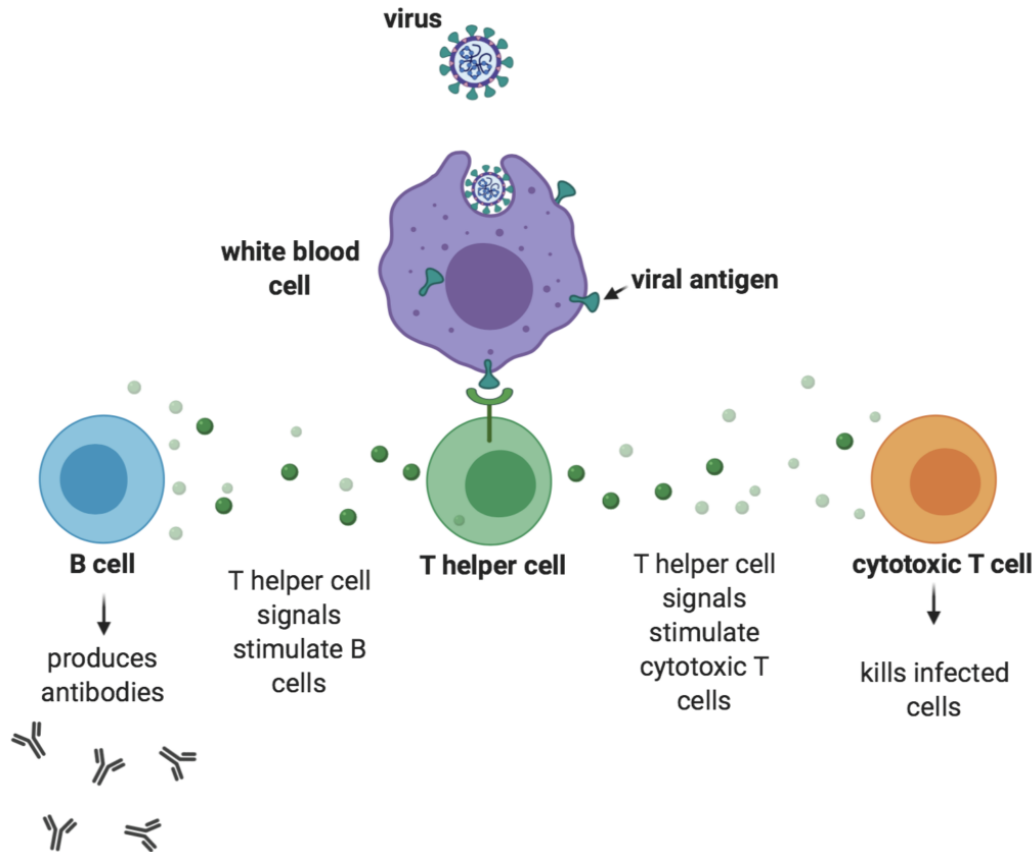
The immune system is a network of cells, tissues, and organs that coordinate with each other to protect the body from illness and disease. Without the immune system, the common cold or the average paper cut could cause death. Over the course of your lifetime, your immune system will help you fight off around 300 colds.

White blood cells, also known as **Leukocytes**, travel through the bloodstream and lymphatic system searching for anything suspicious. There are around 4,000-11,000 leukocytes in one microliter of blood. There are two types of leukocytes called **phagocytes** and **lymphocytes**. Phagocytes trigger the body's immune response. They send **macrophages** and **dendritic** cells into the bloodstream. These cells ingest any foreign cells they find.

Once the antigen is identified, the cells notify the lymphocytes. Cytotoxic **T-cells** are sent to find infected cells so they can be destroyed. As this process is occurring, **B-cells** and **helper T-cells** use the antigens to create antibodies that protect the rest of the cells.

It can take a few days for the immune response to complete. Even though the immune system can prevent illness, it is not meant to keep you from ever getting sick. The main purpose of the immune system is to mitigate the situation enough to keep the body alive.

The Immune system Working Inside the Body



Healthy immune systems have long, positive long-lasting effects. Long-term immunity occurs when T-cells and B-cells become familiar with returning foreign bodies. Each time the body encounters a new virus, it stores that information for future use. This knowledge makes the immune system's response more efficient. However, some people's immune systems do not work in the ways they should. Some people have illnesses that sabotage the immune system, making it less effective in protecting the body. Examples of these are Autoimmune Disease, Arthritis, Type 1 Diabetes, and Multiple Sclerosis.

Vaccines mimic this reaction in the body through the use of dead viruses. This way the body is able to create antibodies for the virus without being under the threat of the actual virus. Vaccines are a helpful addition to the body's immune response.