

Difference Between Phagocytes and Lymphocytes

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Key Difference – Phagocytes vs Lymphocytes

The [immune system](#) acts against [pathogens](#) which enter the body. There are two types of immune cells involved in this action. They are phagocytes and lymphocytes. **Phagocytes are a type of white blood cells which ingest foreign particles and destroy them. Lymphocytes are another type of white blood cells which recognize pathogens via cell surface receptors and destroy them in several ways.** This is the key difference between phagocytes and lymphocytes. Both fight against diseases by engulfing germs or producing [antibodies](#).

What are Phagocytes?

Phagocytes are a type of [white blood cells](#) found in the blood. These cells protect the body by ingesting and destroying harmful foreign particles such as [bacteria](#), dead and dying [somatic cells](#). Phagocytes are a part of the body's immune system. They are produced in the bone marrow by [mitotic cell division](#).

The ingestion process of foreign bodies by phagocytes is known as [phagocytosis](#). During phagocytosis, phagocytes engulf the foreign particle and kill it using a variety of methods. Phagocytosis occurs as follows

1. Phagocytes surround the microbe or dead cell.
2. Microbe or dead cell is engulfed completely by the phagocytes.
3. They are trapped inside a phagosome or phagocytic vesicle.
4. Enzyme containing organelles called [lysosomes](#) then fuse with the phagosome, creating a structure called a phagolysosome
5. The microbe or the dead cell is killed and destroyed by the phagolysosome.

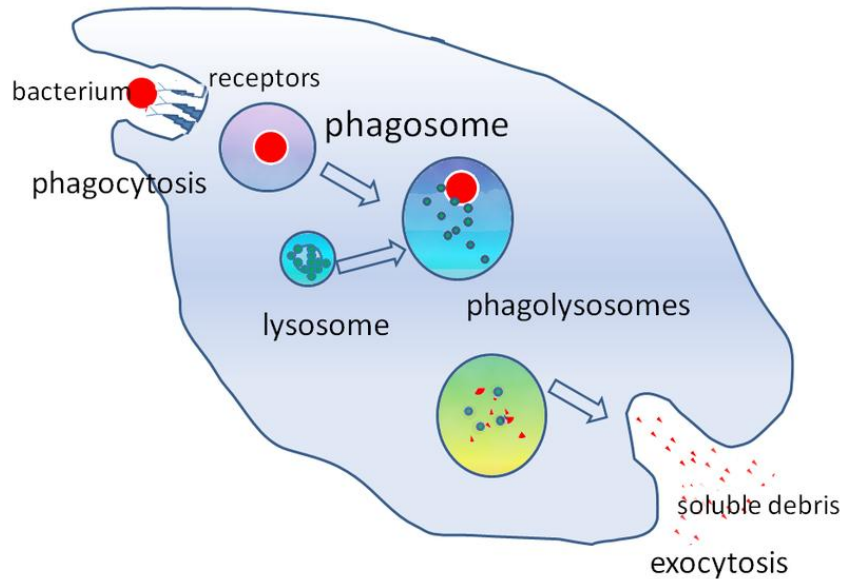


Figure 01: Phagocytosis

Phagocytes are extremely important in disposing of dead somatic cells that have undergone programmed cell death. These cells should be disposed from the body to provide space for new cells. It is mainly done by phagocytes in the body. Certain chemicals are released from the dead or dying cells. They are detected by the nonprofessional phagocytes and ingested by phagocytosis. Professional phagocytes detect bacteria and other microbes that are not normally present in the body. Viruses cannot be destroyed by phagocytosis since they use the same mechanism of phagocytosis to invade white blood cells and infect the host cells.

Phagocytes destroy foreign particles using either intracellular or extracellular processes. Intracellular killing process requires molecules that contain oxygen because oxygen undergoes several chemical reactions that produce hydrogen peroxide when the enzymes of the phagolysosomes are contacted. Hydrogen peroxide works as an antiseptic and a disinfectant. Some other intracellular processes also kill bacteria using antimicrobial proteins in the phagolysosomes. Extracellular processes depend on proteins called interferon gamma and activate macrophages.

There are different types of phagocytes such as [neutrophils](#), [monocytes](#), [macrophages](#), mast cells, and dendritic cells. Neutrophils are the most common type of phagocytes and they usually act as the first defense against the infections. Phagocytic action is nonspecific. Hence, they can act against any type of invading organism.

What are Lymphocytes?

Lymphocytes are one main type of immune cells produced by the immune system. They are white blood cells present in the blood. There are three types of lymphocytes named [T lymphocytes](#), [B lymphocytes](#), and [natural killer cells](#). Natural killer cells recognize and destroy altered cells or cells that have been infected by viruses. B cells produce antibodies which work on bacteria and viruses and neutralize them. There are two types of T cells. One type of T cells produce cytokines that induce the immune response and the second type produces granules that are responsible for the death of the infected cells. Lymphocytes, mainly T and B cells, produce memory cells which provide long lasting immunity against that specific pathogen. Lymphocytes derived from lymphoblasts and lymphoblasts are formed from lymphoid stem cells.

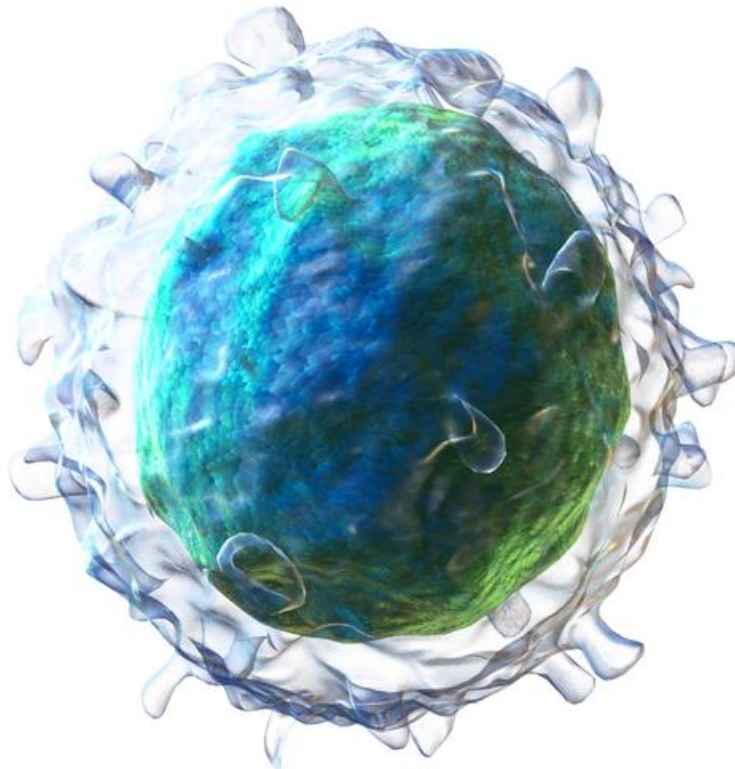


Figure 02: Lymphocyte B cell

What are the similarities between Phagocytes and Lymphocytes?

- Phagocytes and lymphocytes are white blood cells present in the blood stream.

- Both fight against foreign particles which enter into the body.
- Both are parts of the immune system.

What is the difference between Phagocytes and Lymphocytes?

Phagocytes vs Lymphocytes	
Phagocytes are a type of white blood cells capable of engulfing and absorbing bacteria and other small cells and particles.	Lymphocytes are a small form of white blood cells occurring especially in the lymphatic system.
Types	
There are different types of phagocytes including neutrophils, monocytes, macrophages, mast cells, and dendritic cells.	There are three main types of lymphocytes named T lymphocytes, B lymphocytes, and natural killer cells.
Phagocytic Nature	
Phagocytes are phagocytic.	Lymphocytes are nonphagocytic.

Summary – Phagocytes vs Lymphocytes

There are several types of white blood cells that react against pathogens. Phagocytes and lymphocytes are main two types. Phagocytes engulf foreign cells and kill them by the process known as phagocytosis. Lymphocytes recognize pathogens by cell membrane receptors and destroy them. This is the difference between phagocytes and lymphocytes. B cells are one type of lymphocytes which make antibodies to destroy antigens. Phagocytes and lymphocytes are equally important parts of the immune system.

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