

*Opinion Article*

# Characteristics of lymphocyte: Its type and function

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## DESCRIPTION

A lymphocyte is a type of white blood cell (leukocyte) in the immune system of most vertebrates. Lymphocytes include natural killer cells (which function in cell-mediated cytotoxic innate immunity), T lymphocytes (for cell-mediated cytotoxic adaptive immunity), and B lymphocytes (for antibody-driven humoral adaptive immunity). They are the main type of cell found in lymph, which gave rise to the name “lymphocyte”. Lymphocytes make up 18% to 42% of circulating white blood cells.

### Characteristics

Microscopically, in a Wright-stained peripheral blood smear, a normal lymphocyte has a large, dark-stained nucleus with little or no eosinophilic cytoplasm. In normal situations, the rough, dense nucleus of a lymphocyte is about the size of a red blood cell (about 7 µm in diameter). Some lymphocytes show a clear perinuclear zone (or halo) around the nucleus or may show a small clear zone on one side of the nucleus. Polyribosomes are a prominent feature in lymphocytes and can be observed with an electron microscope. Ribosomes are involved in protein synthesis, which enables the production of a large number of cytokines and immunoglobulins by these cells.

It is impossible to distinguish between T cells and B cells in a peripheral blood smear. Flow cytometry testing is commonly used for specific lymphocyte population counts. This can be used to determine the percentage of lymphocytes that contain a particular combination of specific cell surface proteins, such as immunoglobulins or Cluster Differentiation (CD) markers, or that produce particular proteins (for example, cytokines using Intracellular Cytokine Staining (ICCS)). In order to study lymphocyte function based on the proteins it generates, other scientific techniques such as ELISPOT or secretion assay techniques can be used.

## Types

There are three types of lymphocytes, known as T cells, B cells, and natural killer cells. T cells get their name because they are developed in the thymus. These cells are distinguished from other lymphocytes by a specialized T-cell receptor molecule located on the surface of the cell. This molecule is important in immunity because it recognizes antigens and is able to bind to them.

B cells are an important part of the immune system. B cells get their name because they mature in the bone marrow of humans and in the organ bursa of birds. These cells are distinguished from other lymphocytes by a protein on their surface known as the B-cell receptor. This protein specializes in recognizing and binding to specific antigens.

Natural killer cells are lymphocytes known to be cytotoxic. This means they have the ability to kill other cells. These cells are an important part of the immune system because they are able to recognize virus-infected cells as well as some types of tumor cells and kill them before they cause much damage.

## Function

All lymphocytes function as part of our immune defenses. In our daily activities, we come into contact with all types of foreign molecules that have the potential to cause us disease. The immune system is key to recognizing foreign material in our body and killing it or removing it in some form. An antigen is a substance that triggers a response from our immune system. When antigens are found by lymphocytes, an immune response is triggered to defend our body.

Lymphocytes, such as T lymphocytes and B lymphocytes, have specific binding sites that allow them to recognize and attach to antigens that have entered the body. T cells perform several vital functions in the immune system, including helping other white blood cells during immune responses and maintaining the body's immunological balance.

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