[3 Types of Immune Cells in Human Peripheral Blood Mononuclear Cells (PBMCs)](http://www.conversantbio.com/blog/3-types-of-immune-cells-in-human-peripheral-blood-mononuclear-cells-pbmcs)

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There are three main types of mononuclear blood cells used in fighting diseases including leukemias, cancers, and infectious diseases. These include lymphocytes, monocytes, and macrophages.

Lymphocytes comprise about 20% of the peripheral white blood cells and derive from the common lymphoid progenitor cell in the bone marrow. They have a large, almost spherical nucleus surrounded by a very distinct amount of cytoplasm. The prominence of this regular nucleus has led to them being referred to as mononuclear leukocytes, or in broader terms, peripheral blood mononuclear cells (PBMCs).

The most important characteristic of these cells is their ability to specifically recognize foreign molecules and destroy it.

## There are 3 major populations of lymphocytes:

### 1. T-Cell (Thymus derived)

Cell surface contains antibody like receptors that see fragments of antigens on the surface of infected or cancerous cells.

### 2. B-Cell (Bone Marrow derived)

Produce antibodies that essentially ambush foreign antigens circulating in the blood stream.

### 3. Natural Killer (NK Cells)

Important players in the innate arm of the immune system.  The provide an early defense against pathogens and tumor transformed cells.

## There are other PBMCs in humans:

1. **Monocytes**, which develop into macrophages, engulf and digest the pathogen and present fragments on their surfaces as a signal. The signal is then picked up by other cells in the adaptive immune system.

2. **Dendritic Cells** are antigen presenting cells with a unique ability to induce primary immune responses. They capture and transfer information from the outside world to the cells of the adaptive immune system.

There are promising immune activities in PBMCs that reach well beyond fighting infection. Research is being conducted to understand their role in cancer and other diseases. By identifying surface and cellular markers, it will be easier for researchers to identify the immune populations that would most benefit from this type of cell therapy.