

# Immune system cells

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The human immune system protects the body against foreign objects, such as micro-organisms. It is made of many different cells that are spread throughout the body, each playing different roles and moving about the body as needed.

## Blood cells

There are two major types of cells in the blood. The most common are red blood cells or erythrocytes, which carry oxygen to the body tissues, and carry away carbon dioxide. The other group are white blood cells, or leukocytes. These are the immune cells.

Some white blood cells recognise specific foreign organisms to which the body has been exposed in the past. These *specific* immune cells are called lymphocytes. Other white blood cells are *non-specific* and can attack a range of different foreign organisms: these include neutrophils, eosinophils and natural killer cells.

## Lymphocytes

There are two different types of lymphocytes. B-lymphocytes (sometimes just called B-cells) produce antibodies. An antibody is a protein that can lock onto a distinctive part of a specific foreign organism. When this happens, the antibody signals to other immune cells to attack the organism.

T-lymphocytes (sometimes just called T-cells) are called different names depending on the molecules on their surface. **CD4 cells** (also known as CD4 T-lymphocytes, or T-helper cells) play a co-ordinating role in the immune system. They help B-lymphocytes identify foreign organisms (which they produce antibodies against). They also secrete substances that enable CD8 cells to reproduce. CD4 cells also activate macrophages (see below) to kill certain organisms, including many causes of AIDS diseases. When CD4 cells are destroyed by HIV, all these parts of the immune system are disrupted. CD8 cells (also known as CD8 T-lymphocytes or cytotoxic T-cells) attach themselves to abnormal body cells, notably cells that have been infected by viruses, and kill them.

## Other immune cells

Natural killer cells (or NK cells) attack tumour cells and virus-infected cells in a similar way to lymphocytes. But while each lymphocyte can only recognise and attack cells infected by one specific virus, natural killer cells can attack a wider range.

Eosinophils attack organisms that are too big to be eaten by a single phagocyte, like worms.

The phagocytes are cells that attack and destroy foreign cells by engulfing them. There are two main types of phagocytes:

- Macrophages roam the blood and the body tissues, killing organisms that can cause AIDS-related diseases and cells infected by viruses.
- Neutrophils leave the blood to go to tissues where infection or inflammation is developing. They mainly attack bacteria and fungi.