Leukocytes Encyclopedia Article

Leukocytes

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Leukocytes

Leukocytes are white **blood** cells made in the bone marrow that defend the body from infective organisms and foreign substances. When **infection** occurs, the numbers of leukocytes increase.

The five types of leukocytes are: neutrophils, eosinophils, basophils, monocytes, and lymphocytes. Neutrophils, eosinophils, and basophils are in a class called polymorphonucelar granulocytes. Their nucleus appears to have segments within it and the remaining volume of the cell, which is called the cytoplasm, is granular in appearance. Each type of leukocyte has granules of distinctive appearance. Monocytes and lymphocytes are grouped together as mononuclear agranulocytes. Their nucleus does not have segments and the cytoplasm is free of granules.

Neutrophils comprise up to 70% of the leukocyte population. They are chemically attracted to the site of injury or infection, where they adhere to blood vessel wall and migrate into the surrounding **tissue**. Infecting **bacteria** are engulfed in a process known as phagocytosis. Flexible "arms" of the leukocyte surround the target and then fuse together, drawing the target into the neutrophil in a vacuole (a structure that can be envisioned as a bag within the cytoplasm). The bacteria are subsequently destroyed by the release of degradative **enzymes**.

Eosinophils make up two to five percent of the total leukocytes. They can survive for weeks and function in allergic responses and against parasites. Eosinophils are also chemically attracted to the trouble spot in the body. Basophils make up less than one percent of the total leukocyte population. They function in the immediate type of immune response that occurs in conditions such as asthma, hay fever, and anaphylaxis.

Monocytes are the largest type of leukocyte. They make up five to eight percent of the total leukocyte population and function as macrophages, which are essentially roving garbage collectors in areas such as the **liver**, lymph nodes, and the **lungs**. Like neutrophils, they engulf debris and microorganisms by the process of phagocytosis and digest them in lysosomal granules. Monocytes are also precursors for several other types of phagocytic cells, such as the Kupffer cells of the liver and bone osteoclast cells.

Lymphocytes are important as B cells and T cells. B cells become activated by the presence of an antigen and produce antibody specific to the antigenic target. T cells are vital components of cell-mediated immunity (which does not depend on the presence of antibodies circulating in body fluids and in tissues).

Abnormally low numbers of leukocytes (called leukopenia) leaves an individual susceptible to infections.