

# Quick Facts about Five White Blood Cells

By studying white blood cells, we can quickly obtain important information about the patient's health. Information that can help you quickly make a diagnosis and provide the right treatment.

The total number of white blood cells has a reference interval of  $3.5\text{--}8.8 \times 10^9/\text{L}$  and is analyzed with a particle counter. These cells can also be counted with a microscope in the usual way.

Neutrophil granulocytes, which make up 50–75 % of the white blood cells are responsible for the greatest changes in the total number of white blood cells.

N.B.! Children have a different distribution compared to adults, primarily a higher percentage of lymphocytes.

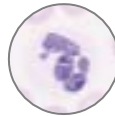
*Reference: Laurells Klinisk Kemi i praktisk medicin (Laurell's Clinical Chemistry in Practical Medicine), 2003, 8th edition.*

## NEUTROPHIL GRANULOCYTES

REFERENCE INTERVAL:  $1.7\text{--}7.5 \times 10^9/\text{L}$

### APPEARANCE

Band or segmented cells (the proportion of band cells increases when new cells are mobilized).



### FUNCTION

Primarily to provide defense against bacteria and fungi. Pus largely consists of dead neutrophils.

#### ↑ NEUTROPHILIA

- inflammatory reactions (infectious and non-infectious)
- leukemoid reaction ( $> 50$ )
- corticosteroids

#### ↓ NEUTROPENIA

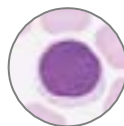
- medication
- cytostatics
- immunological reactions (SLE, Felty's Syndrome, B12 and folate deficiency, leukemia)
- agranulocytosis (bone marrow damage or bone marrow disease)

## LYMPHOCYTES

REFERENCE INTERVAL:  $1.1\text{--}4.8 \times 10^9/\text{L}$

### APPEARANCE

Large nucleus with smaller amount of cytoplasm.



### FUNCTION

Primarily as an agent for cellular and anti-body-mediated immunity.

#### ↑ LYMPHOCYTOSIS

- acute viral infections
- rubella
- mononucleosis (variant lymphocytes)
- chronic lymphocytic leukemia

#### ↓ LYMPHOCYTOPENIA

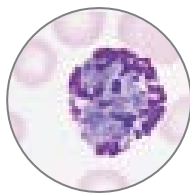
- corticosteroids
- cytostatics
- Hodgkin's disease (and other lymphomas)
- celiac disease
- SLE
- AIDS

## BASOPHIL GRANULOCYTES

REFERENCE INTERVAL:  $0.0-0.2 \times 10^9/L$

### APPEARANCE

Bi-lobed or tri-lobed nucleus.



### FUNCTION

Mainly mediate allergies, normally < 0.5 % of circulating blood cells in healthy people, contain large amounts of histamine which triggers the allergic reaction.

#### ↑ BASOPHILIA

- atopic diseases (allergic rhinitis and asthma)
- polycythemia vera
- chronic myeloid leukemia

#### ↓ LOW VALUES

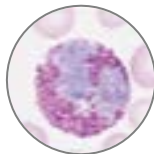
- No clinical significance

## EOSINOPHIL GRANULOCYTES

REFERENCE INTERVAL:  $0.0-0.6 \times 10^9/L$

### APPEARANCE

Bi-lobed nucleus, cytoplasm is full of small granules.



### FUNCTION

Primarily to protect us from endoparasites.

#### ↑ EOSINOPHILIA

- allergic conditions
- asthma
- parasites
- rheumatoid arthritis
- vasculitis
- chronic myeloid leukemia
- Hodgkin's disease
- hypereosinophilic syndrome

#### ↓ LOW VALUES

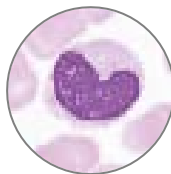
- corticosteroids (without signs of disease)

## MONOCYTES

REFERENCE INTERVAL:  $0.1-1.0 \times 10^9/L$

### APPEARANCE

Kidney-shaped nucleus, a lot of cytoplasm.



### FUNCTION

Primarily to present antigen to lymphocytes.

#### ↑ MONOCYTOSIS

- prolonged inflammatory conditions
- infectious conditions (endocarditis, TB)
- non-infectious conditions (Crohn's disease, sarcoidosis, chronic myelomonocytic leukemia, chronic myeloid leukemia, acute myeloid leukemia)

#### ↓ LOW VALUES

- corticosteroids