2. Leucocytes

4000-11,000/mm³ or 1% of blood volume

numbers are misleading since they do most of their work outside the blood vessels

mainly function in protection of body as part of immune system

WBC’s are motile by amoeboid motion
  they squeeze out of capillaries into tissue spaces
  attack and destroy bacteria and pathogens
  remove dead cells and tissues

slightly larger than RBC’s = 8µm diameter

large, irregular, lobed nucleus

live for a few hours to a lifetime

5 different kinds of WBC’s:

the numbers of each type per unit of blood are clinically important

  = differential WBC count

ID depends on presence and staining characteristics of granules and nucleus:

1. neutrophils
   40-70%
   granulocyte
   attracted to sites of inflammation
   lifespan: hours - days
   especially bacteria and some fungi
   indicate: acute infections and appendicitis

2. eosinophils
   1-4%
   granulocyte
   especially abundant in pulmonary mucosa and dermis
   counteract inflammatory chemicals
   eat proteins, not “bugs”
   lifespan: days
   indicate: worms and protozoan parasites
3. **basophils**
   <1%
   granulocyte
   least abundant of WBC’s
   tissue basophils = Mast Cells
   bind to Ig E → release of heparin and histamine → leaky vessels
   enhance migration of WBC’s to site
   lifespan: hours - days

4. **lymphocytes**
   20-45%
   agranulocytes
   only few in “blood”
   T and B cells
   lifespan: hours to years

5. **monocytes**
   5-8%
   agranulocytes
   only few in blood
   in tissue become macrophages
   lifespan: months
   increases: chronic infections, eg TB and viruses mononucleosis

**Formation** (Leucopoiesis)

**granular** WBCs usually formed from stem cells in **bone marrow**

**agranular** WBC’s are formed from stem cells in **lymphatic tissue**

stimulated by hormone, CSF (colony stimulating factor) from macrophages and T lymphocytes exposed to antigens and toxins

lifespan: hours to lifetime

**Leukocyte Disorders**

1. **Leukocytosis**
   total WBC count >10,000/mm³
   indicate:
   acute infections, eg appendicitis
   vigorous exercise
   excessive loss of body fluids
Leukemia

cancer characterized by uncontrolled production of leucocytes

but large numbers are usually nonfunctional
crowd out functioning WBC’s
may become anemic as normal marrow is crowded out

myeloid leukemia > granulocytes

lymphoid leukemia > lymphocytes

2. Leukopenia

total WBC count <5,000/mm³
indicate:
influenza
measles
mumps
chickenpox
poliomyelitis
anemias
lead poisoning