

Chapter 17 Blood

Blood Content:

plasma + formed elements

formed elements - living blood

"cells" suspended in plasma

- **Erythrocytes** - (RBCs) red blood cells
- **leukocytes** - (WBCs) white blood cells
- **platelets** - cell fragments



- plasma

(Buffy coat)
- WBCs + platelets
- RBCs

plasma - non living fluid matrix

90% water

60% albumin

36% Globulins

4% fibrinogen

- nutrients
- hormones
- wastes
- gases
- proteins

Sticky, opaque, metallic taste pH = 7.35 - 7.45

high O_2 - scarlet, low O_2 - dark red V = 5-6L men, 4-5L women

Blood function:

1. **Distribution** - delivering O_2 and nutrients to body cells; transporting metabolic wastes to lungs and kidneys for elimination; transporting hormones from endocrine organs to target organs
2. **Regulation** - maintaining body temp by absorbing and distributing heat; maintaining normal pH buffer; maintaining adequate fluid volume in circulatory system
3. **protection** - preventing blood loss - plasma proteins and platelets $\rightarrow$ clot formation; preventing infection

RBCs



Spectrin - provides flexibility to change shape

no nucleus

biconcave disks, **anucleate**, no organelles

RBC function: respiratory gas transport, hemoglobin binds with O_2

• 97% hemoglobin form fib function

Hemoglobin - protein in RBC that carries oxygen

Hb

Globin: **Heme**:

- 4 polypeptide chains
- pigment bonded to globin
- 2 alpha + 2 beta chains
- chain - gives blood red color

Oxyhemoglobin - ruby red - O_2 loading in lungs

deoxyhemoglobin - dark red - O_2 unloading in tissues

Carbamino hemoglobin - 20% CO_2 in blood binds to Hb

- heme iron (Fe) binds to 1 O_2
- RBC - 250mil Hb molecules
- Each Hb can produce 4 O_2

Hematopoiesis

- formation of blood cells in red bone marrow

hemocytoblasts - hematopoietic Stem Cells

hematocrit - % of blood volume that is in RBCs

49% $\pm$ 5% (males), 42% $\pm$ 5% (females)

Anatomy Study Guide Blood

Calvin Yates

A red circular graphic with a gradient, appearing as a stylized arrow or a partial circle, located to the right of the author's name.

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