

Do Now

What makes up more than 95% of the red blood cell?

If I add Anti-A Antibody to unknown blood sample and agglutination occurs, what antigens are present on the RBCs?

Why is iron important for RBC function?

White Blood Cells

Cardiovascular System - Part V

White Blood Cells

- 5,000 - 10,000 WBCs/mL of blood
- Contain a nucleus and organelles
- Lack hemoglobin
- Can be granular or agranular
- Help defend the body by removing wastes, toxins, & damaged cells
- Spend most of their time in the connective tissue of organs

When Duty Calls

When WBCs are in circulation they help with damage

1. All WBCs can leave the bloodstream to enter the damaged area
2. All WBCs are capable of amoeboid movement
3. All WBCs are attracted to specific chemical stimuli
4. Some WBCs are capable of phagocytosis

WBC Production

- Produced by stem cells (progenitor cells) in bone marrow
- Hormones help regulate WBC production by targeting colony-stimulating factors (CSFs)
- When antigens appear, WBC production will increase

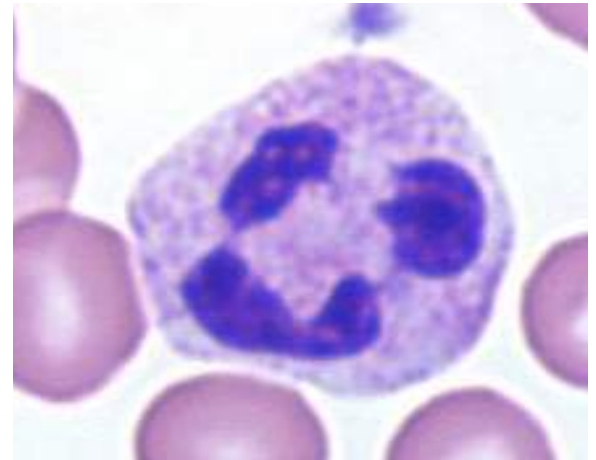
Types of WBCs

Five types of WBCs:

- neutrophils
- eosinophils
- basophils
- monocytes
- lymphocytes

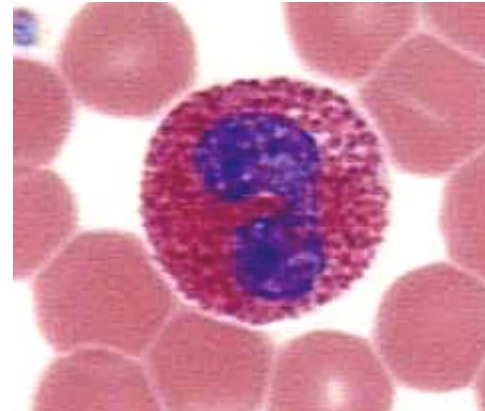
Neutrophils

- Most abundant WBC
- Nucleus resembles a string of beads
- Phagocytic
 - engulf pathogens or debris



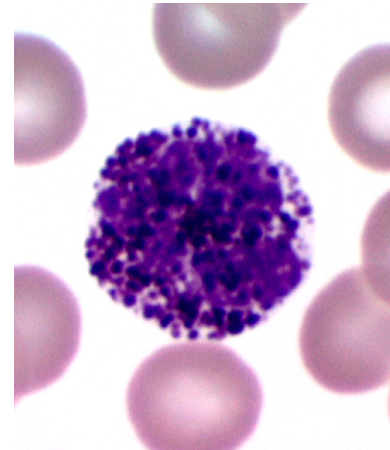
Eosinophils

- Nucleus with two lobes
- Phagocytic
 - engulf antibody labeled materials
- Reduce inflammation



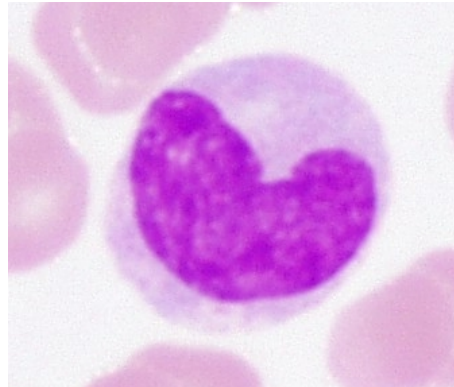
Basophils

- Nucleus is small & round
 - hard to see due to granules
- Release histamine to promote inflammation in damaged tissues



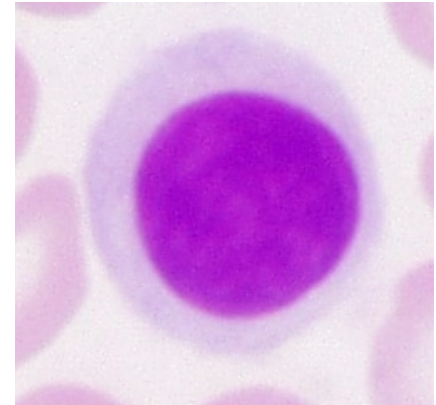
Monocytes

- Large cells with bean shaped nuclei
- Phagocytic
 - engulf pathogens & debris
- Move into tissues and survive for months



Lymphocytes

- Large, round nucleus
- Defend against toxins and pathogens
 - T cells - defend against foreign cells
 - B cells - produce antibodies to attack foreign antigens
 - NK cells - destroy abnormal tissue cells

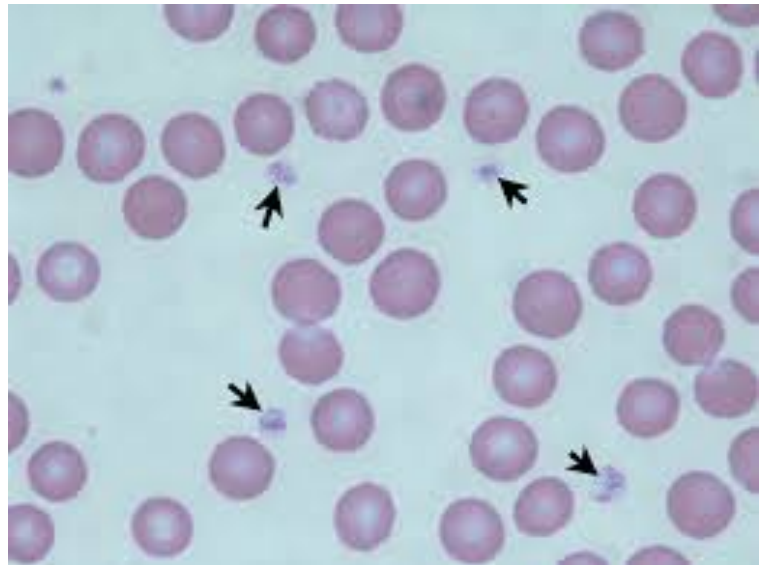
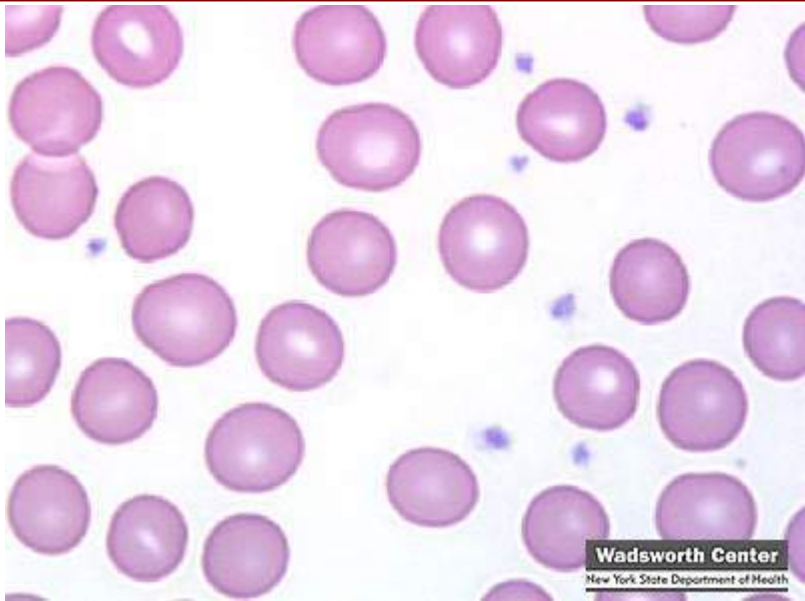


Platelets

Cardiovascular System - Part VI

Platelets

- Cell fragments in the formed elements
- No nucleus
- Important role in the clotting system
- Continuously replaced
 - phagocytized in 9-12 days
- Reserved in the spleen
- Functions:
 - Release important clotting chemicals
 - Form temporary patches in damaged blood vessel walls
 - Contraction after clot formation



Platelet Production

- Thrombocytopoiesis
- Occurs in bone marrow
- Thrombopoietin, Interleukin-6, and multi-CSF stimulates platelet production