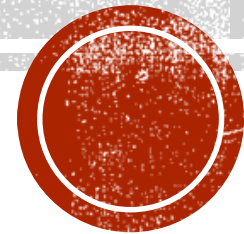
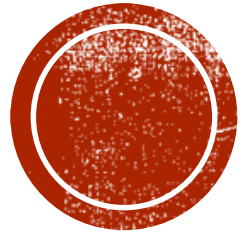


# CIRCULATORY SYSTEM

11 BIOLOGY -- UNIT 3





# BLOOD COMPONENTS



What is blood??? How is it made??? What is its purpose???

Simply put, blood is **the fluid that travels through your circulatory system.**

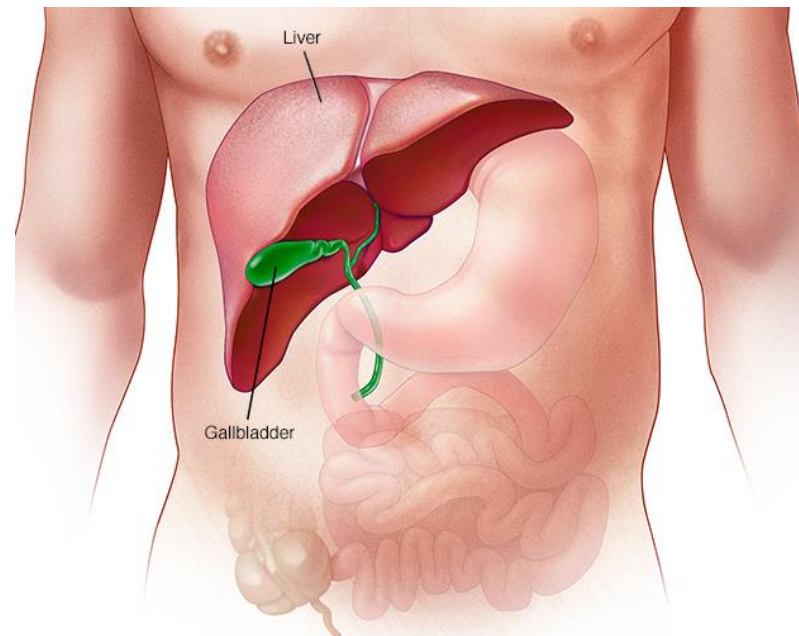
Blood has 3 main functions:

<b>TRANSPORT</b>	<b>REGULATE</b>	<b>PROTECT</b>
<ul style="list-style-type: none"><li>■ Nutrients and oxygen TO the cells</li><li>■ Waste and CO<sub>2</sub> AWAY from the cells</li></ul>	<ul style="list-style-type: none"><li>■ Body temperature</li><li>■ Body fluids</li></ul>	<ul style="list-style-type: none"><li>■ Protect against disease and infections.</li></ul>



# FUN FACT:

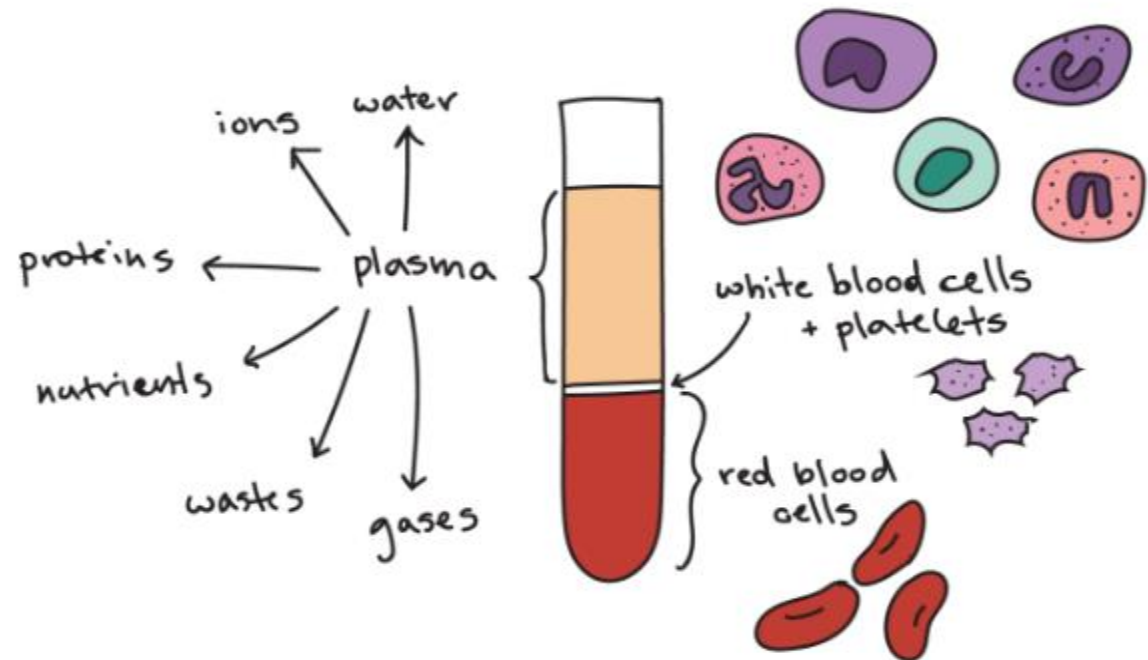
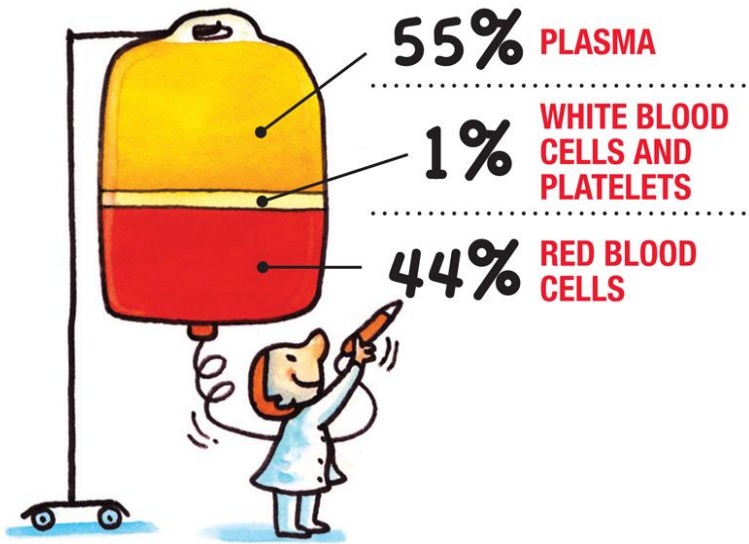
About 1 litre of blood just passed through your liver in the last minute. If your liver stopped working, you would die within 24 hours.

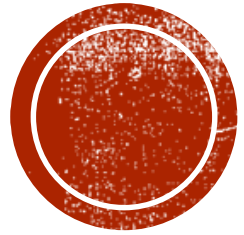


Our blood is made of two main components:

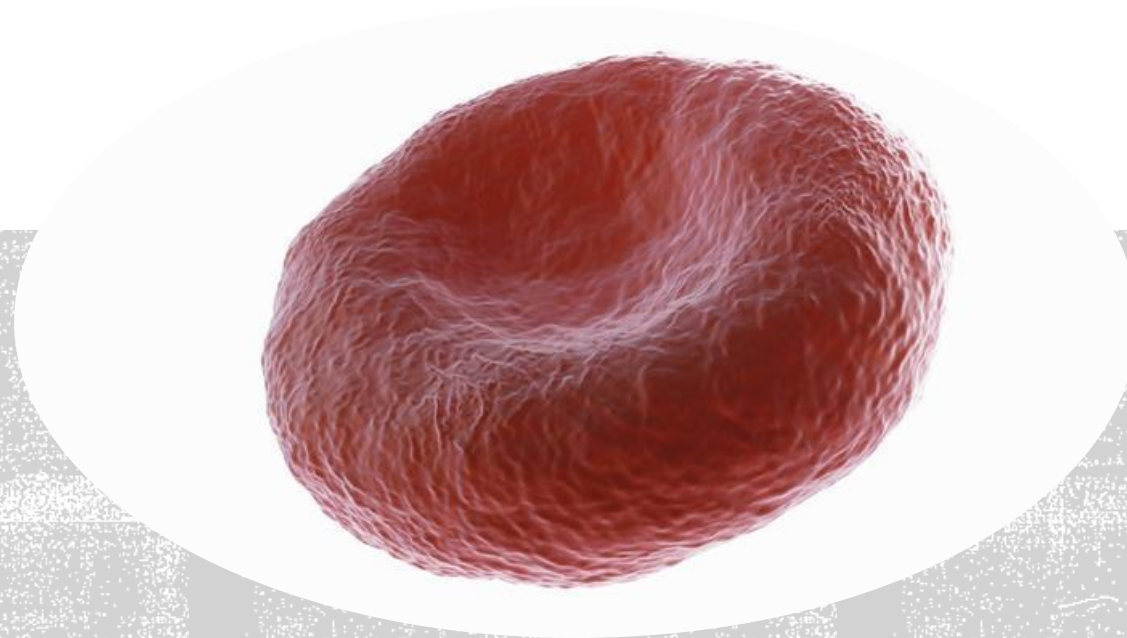
45% CELLS

55% PLASMA

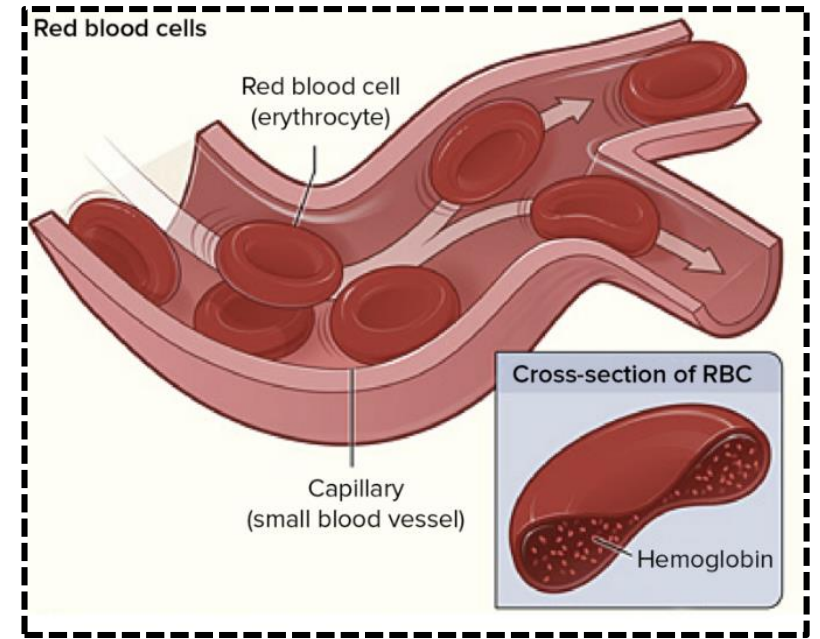


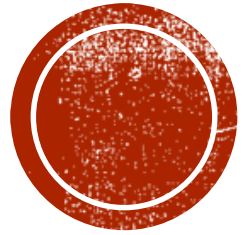


# ERYTHROCYTES

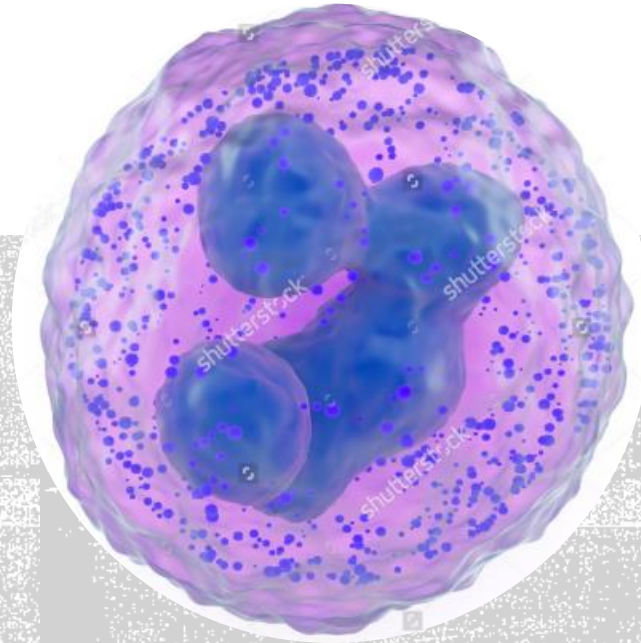


- **Biconcave disk, no nucleus.**
- Small shape (better for diffusion)
  - Carry O<sub>2</sub> and CO<sub>2</sub>
  - Short life span
  - Made in bone marrow
- Contains **HEMOGLOBIN**, a key protein in oxygen transport.
- Red blood cells have an average life span of **120 days**. Old or damaged red blood cells are broken down in the **liver and spleen**, and new ones are produced in the **bone marrow**.





# LEUKOCYTES





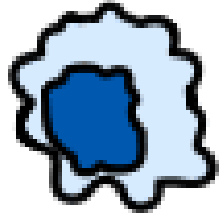
- Have a nucleus
- they are primarily involved in immune responses, recognizing and neutralizing invaders such as bacteria and viruses.
- Different types of white blood cells have different lifetimes, ranging from hours to years
- One group, the granulocytes, includes neutrophils, eosinophils, and basophils, all of which are granular and found in the bone marrow.
- The other group, the agranulocytes, includes monocytes and lymphocytes, which do not have granules and are found in lymph tissue.



# Leukocytes



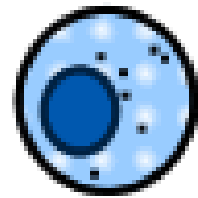
Lymphocyte



Macrophage



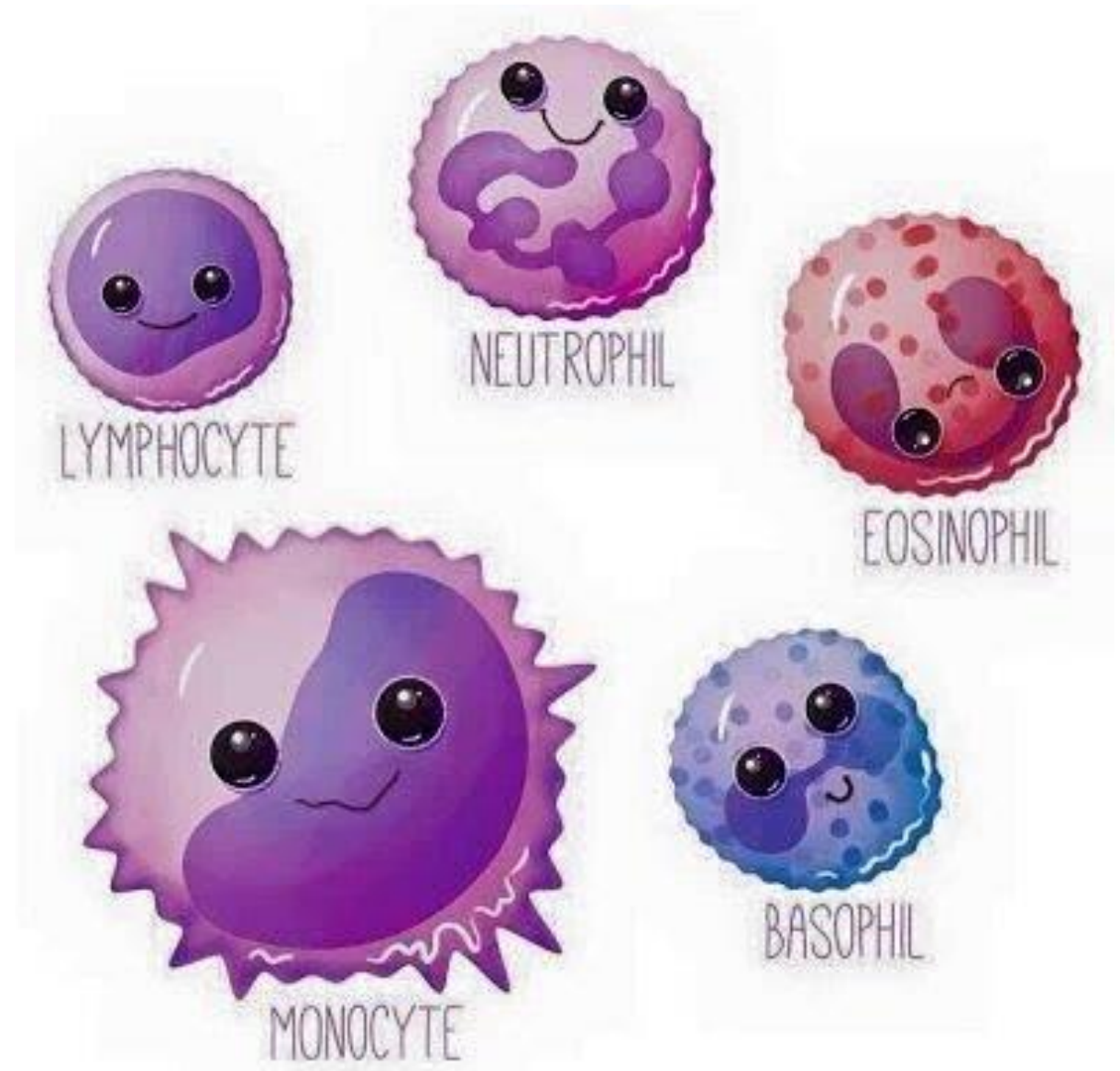
Neutrophil

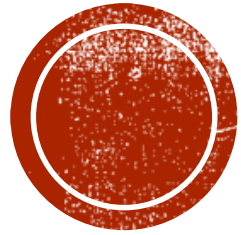


Eosinophil

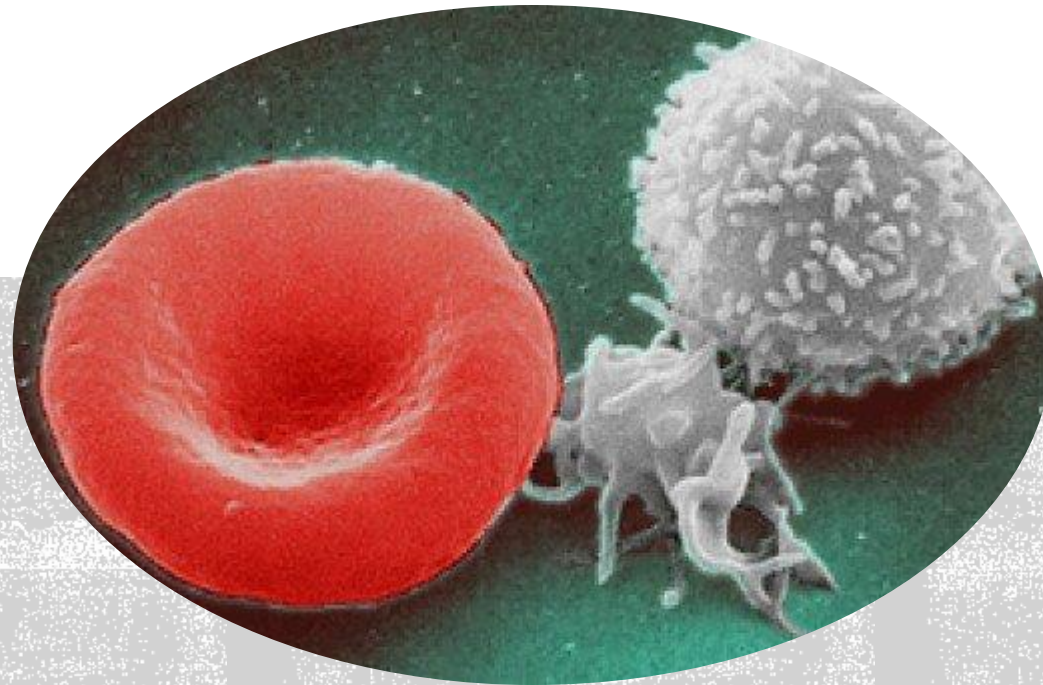


Basophil

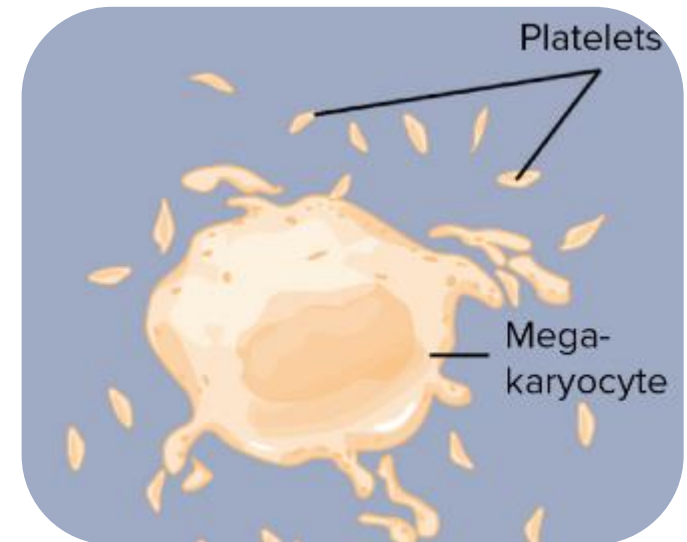
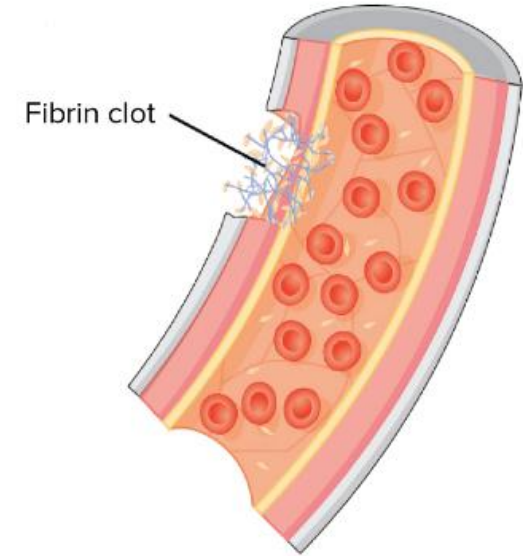




# THROMBOCYTES

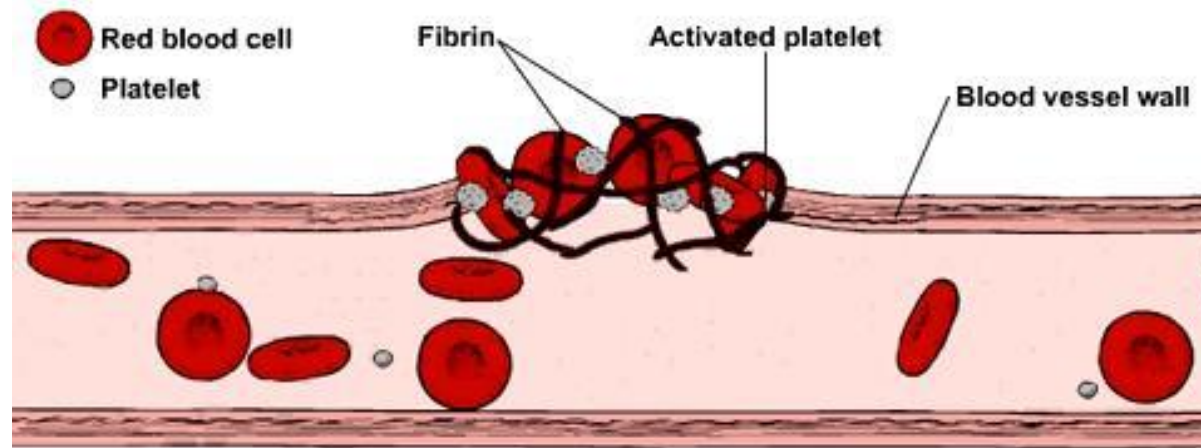


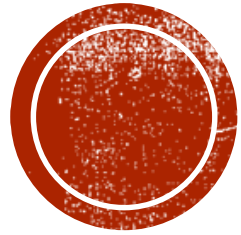
- No nucleus
- Form blood clots
- They are produced when large cells called **megakaryocytes** break into pieces, each one making 2000 - 3000 platelets as it comes apart.
- When the lining of a blood vessel is damaged (for instance, if you cut your finger deeply enough for it to bleed), platelets are attracted to the wound site, where they form a sticky plug. The platelets release signals, which not only attract other platelets and make them become sticky, but also activate a signaling cascade that ultimately converts fibrinogen, a water-soluble protein present in blood plasma, into **fibrin** (a non-water soluble protein). The fibrin forms threads that reinforce the platelet plug, making a clot that prevents further loss of blood.



# FUN FACT:

Your inner body regularly springs little leaks of blood, but the blood quickly clots to plug the hole. If it didn't clot, your insides would just keep bleeding.

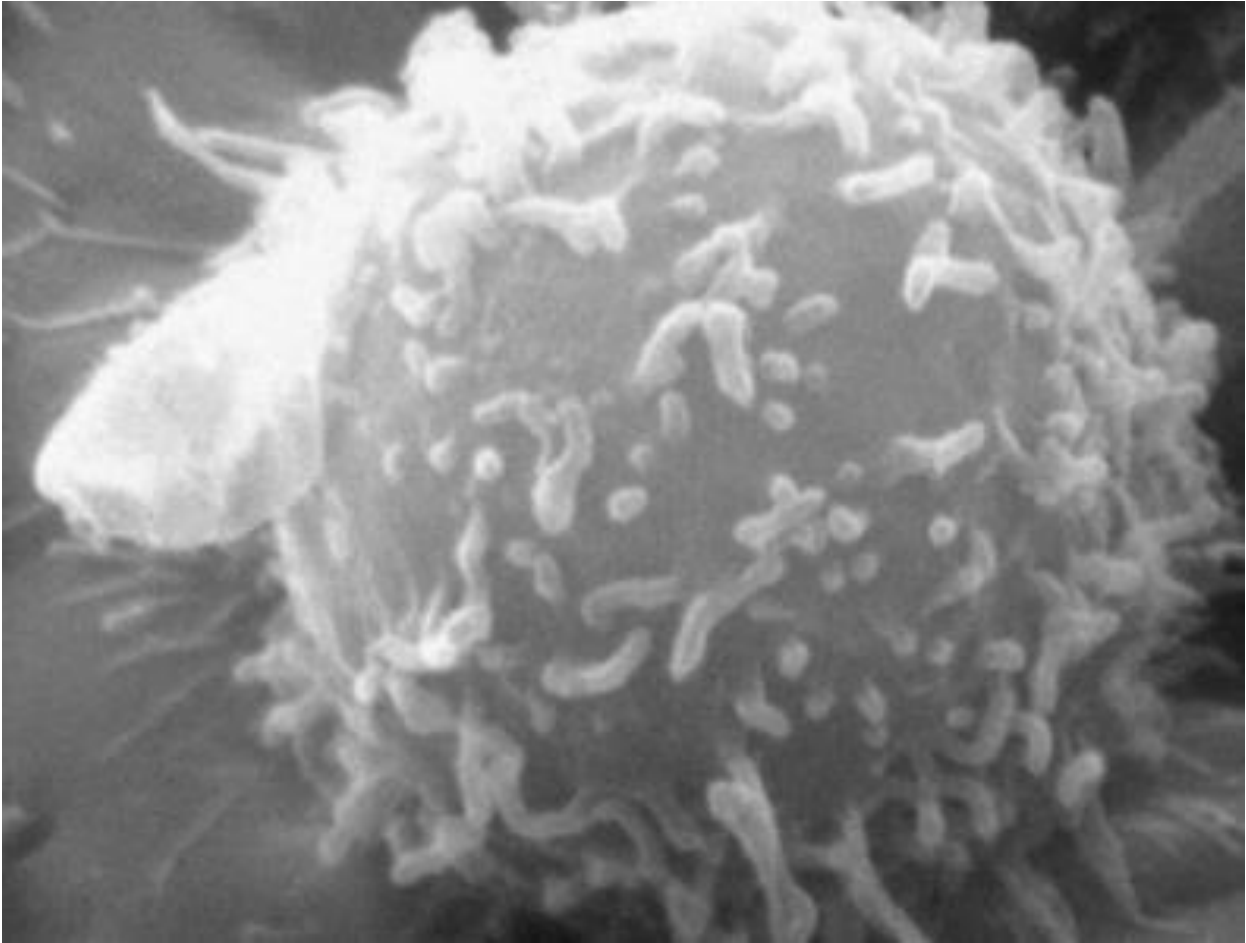




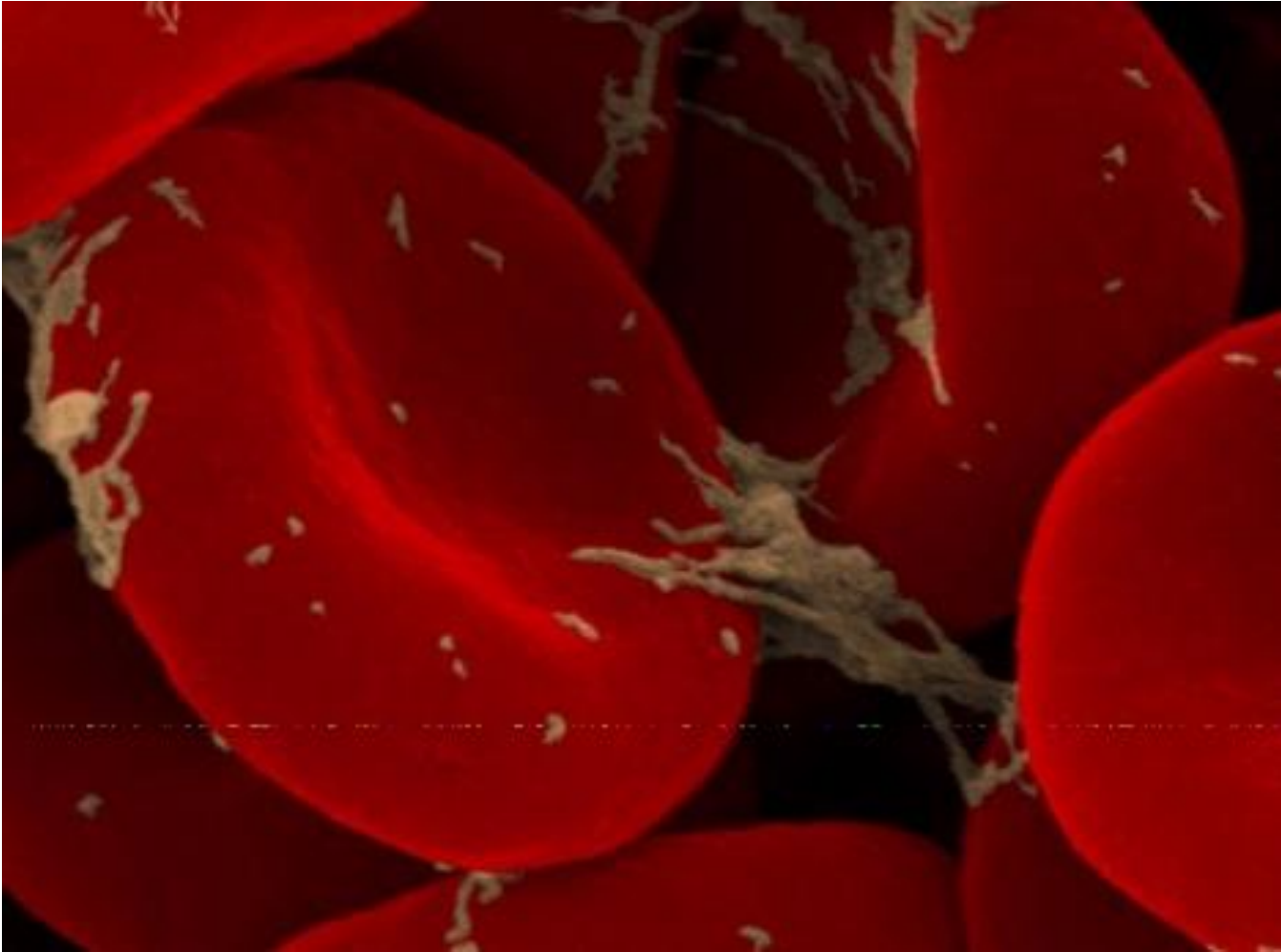
# WHAT IS DAT?

WORK ON YOUR LESSON PAGE TO IDENTIFY THE FOLLOWING IMAGES

**IMAGE ONE**

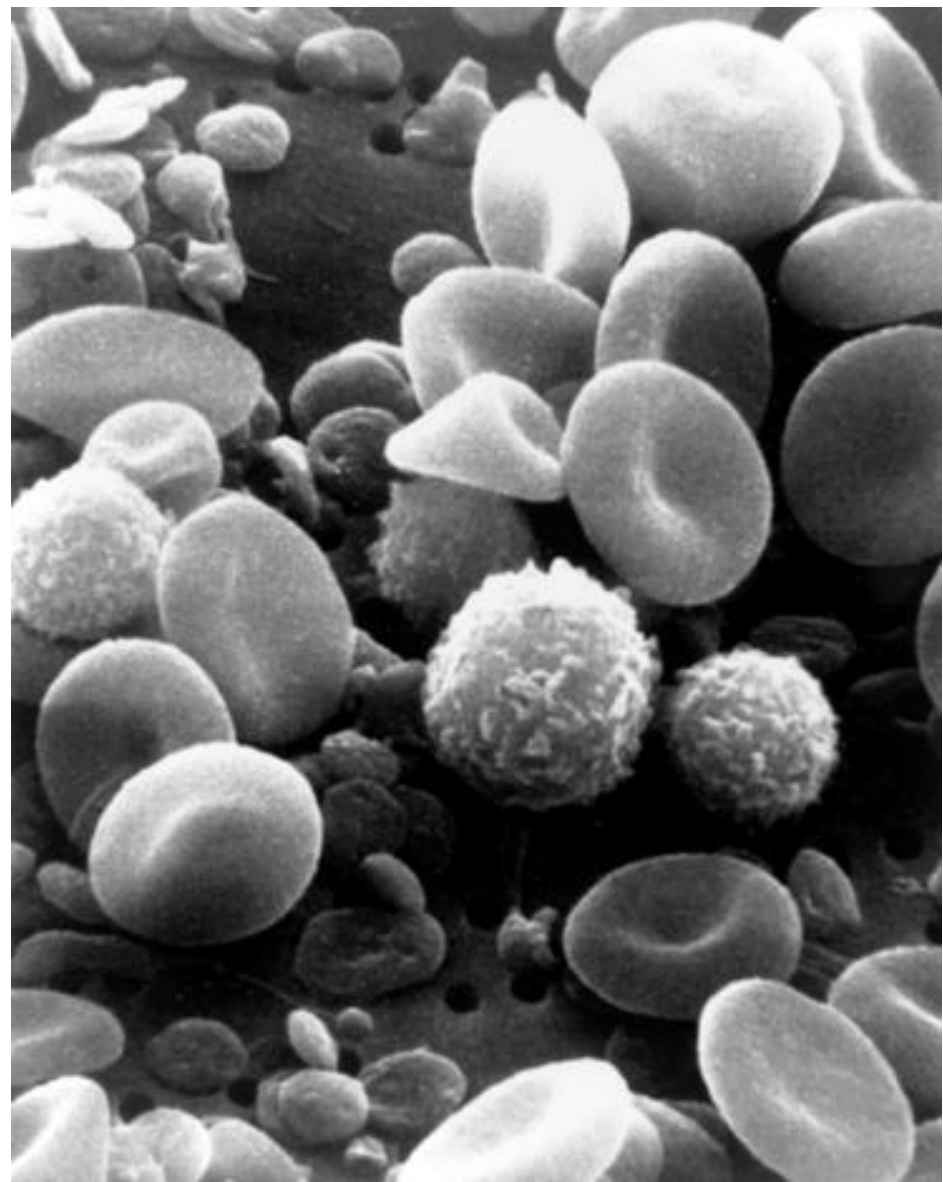


**IMAGE TWO**

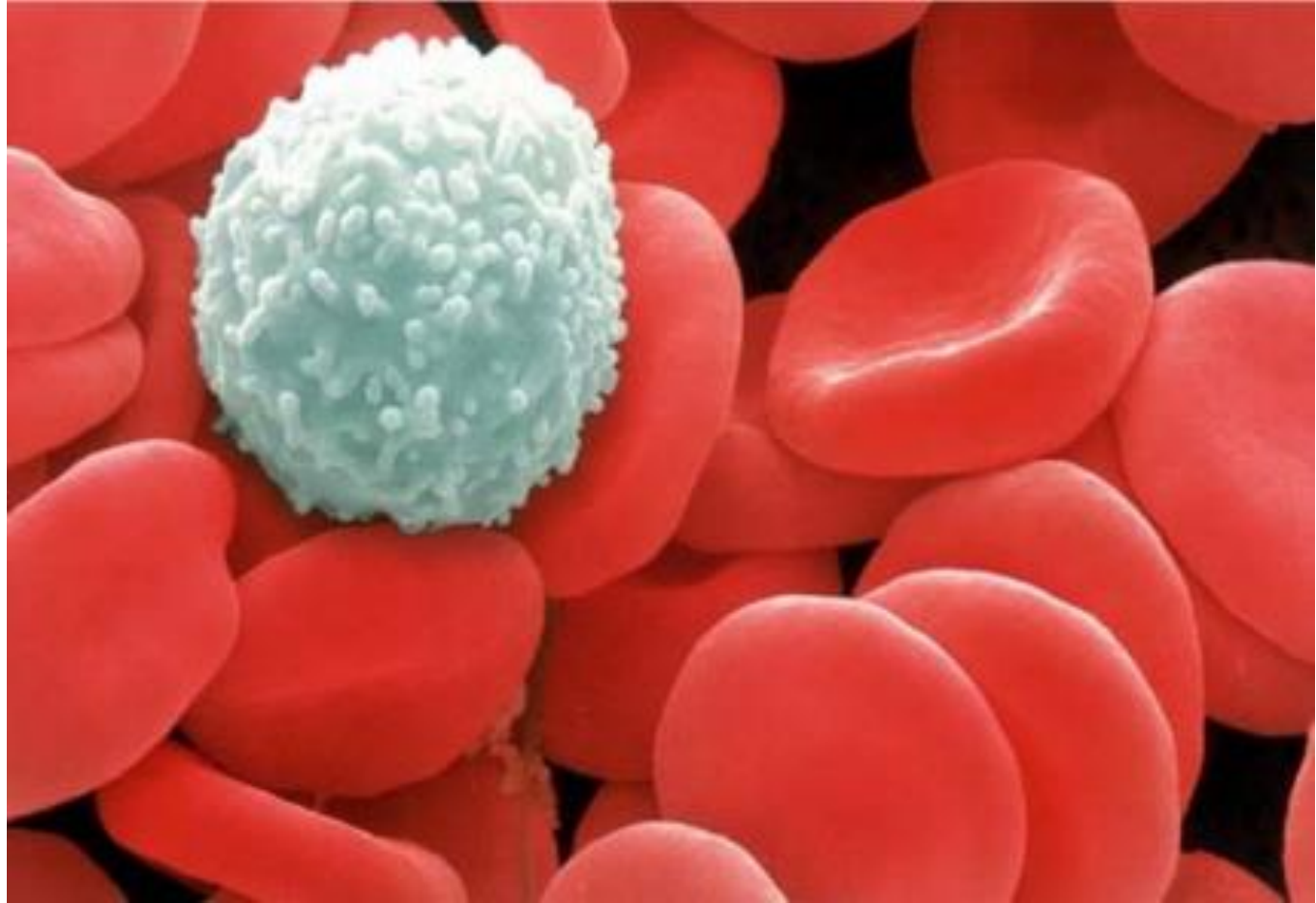




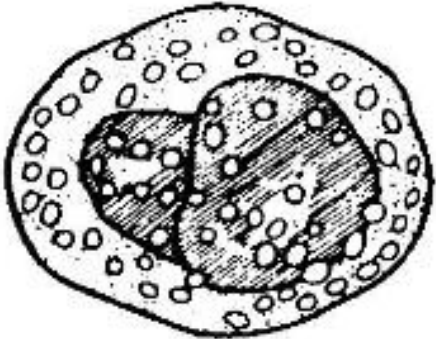
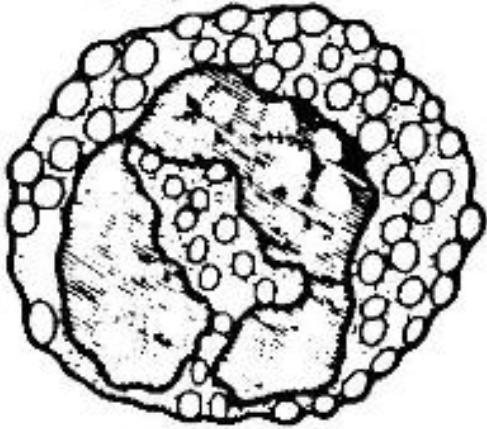
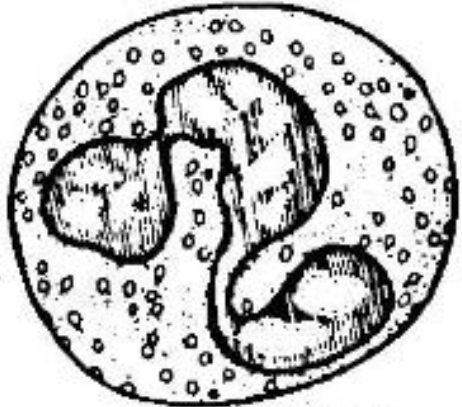
**IMAGE THREE**



**IMAGE FOUR**



**IMAGE FIVE**



**IMAGE SIX**

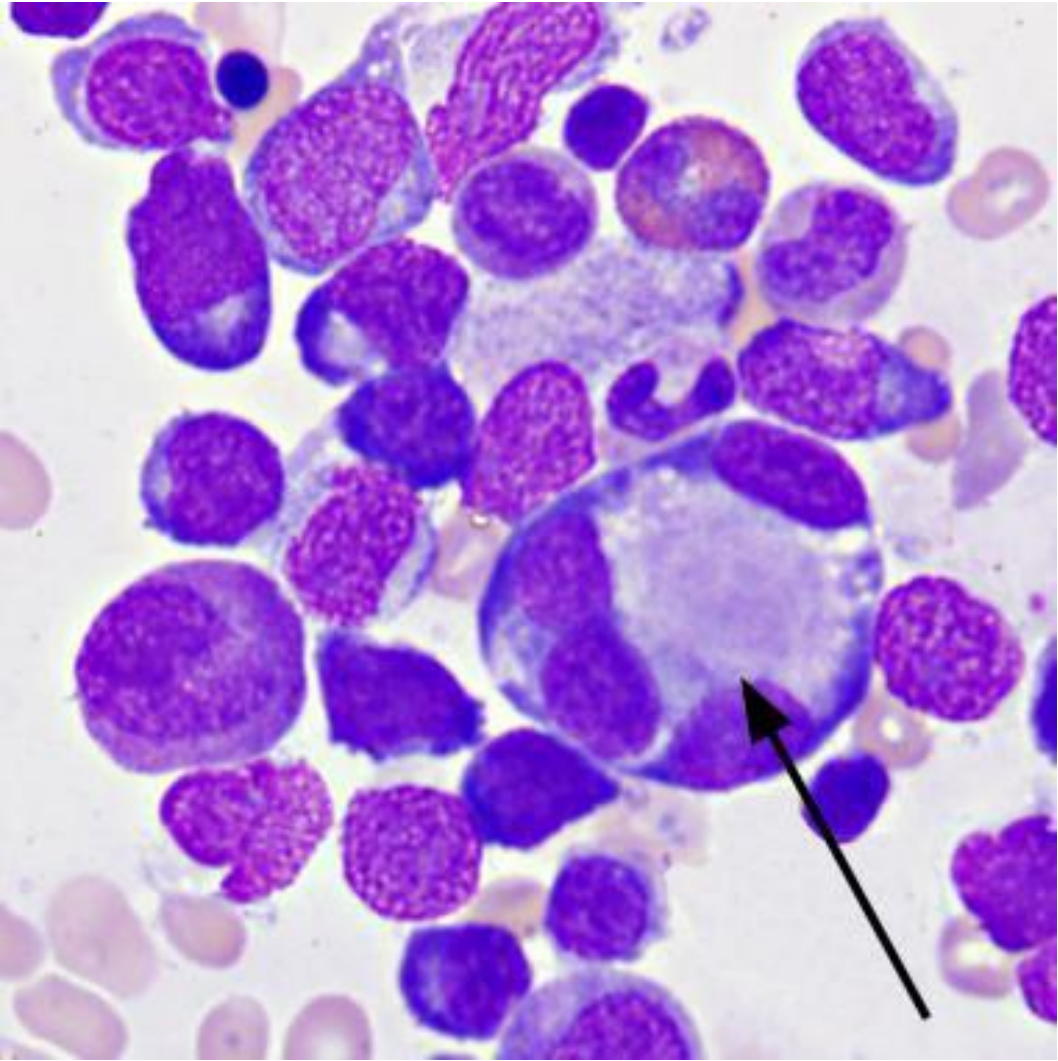


IMAGE	WHAT IS IT?
IMAGE ONE	WHITE BLOOD CELL
IMAGE TWO	RED BLOOD CELL
IMAGE THREE	MIXTURE OF CELLS
IMAGE FOUR	MOSTLY RED, ONE WHITE BLOOD CELL
IMAGE FIVE	GRANULAR WHITE BLOOD CELLS ~GRANULOCYTES~
IMAGE SIX	MEGAKARYOCYTE SPLITTING INTO PLATELETS



# PONDER IT...

*Explain a real-life scenario when you, or someone you know had a blood test done. What was it for? How was it done? Where was it done? Did you have to wait for the results? Were the results useful?*

