What is Blood Cell Pathology?

Pathology is the science of the cause and effects of disease. So this presentation will focus on the morphological pathology of blood cells in the body.

A pathologist is one of the many medical professionals that examines body tissue or specimens for different purposes that include forensics and diagnostics.
What are different types of blood cells?

There are three different types of blood cells.

1. Erythrocytes (Red Blood Cells)
2. Leukocytes (White Blood Cells)
3. Thrombocytes (Platelets)

All three types have different roles in maintaining a healthy and working body.

FUN FACT!

Your blood makes up about 7% of your body weight.
Erythrocytes

These little red blood cells carry oxygen from your lungs to your tissues and they also transport Carbon Dioxide back to your lungs.

They are very tiny cells that are shaped like biconcave discs to allow for increased surface area so they can carry more oxygen to the tissues.

For this reason, they do not have a nucleus!

Red blood cells are the most common cell in your body, and live about 120 days.
Leukocytes

There are 5 different types of leukocytes:

1. Monocyte
2. Neutrophil
3. Eosinophil
4. Basophil
5. Lymphocyte

Three of these can be further divided into granulocytes (Neutrophil, Eosinophil and Basophil) because they contain visible granules throughout the cell.

Monocytes and Lymphocytes have no granules.
White blood cell types

Monocyte: fight against bacteria, viruses and fungi.

Neutrophil: Destroy bacteria and other pathogens.
White blood cell types

Eosinophil (left) and Basophil (right): combat parasitic infections and allergies

Lymphocyte: recognize antigens, produce antibodies, and destroy infected cells
Thrombocytes

Thrombocytes, or more commonly known as platelets, are small blood cells that shed off of a larger cell called a “Megakaryocyte”.

Their most important role in the body is to aid in clotting blood.

The term used to describe the creation of thrombocytes is called “Platelet shedding”.

Platelets

Megakaryocyte
Red Blood Cell Diseases

Sickle Cell Disease

Red blood cell in the “sickle” shape due to a genetic mutation.

Anemia

Decrease in the number of red blood cells due to an underlying cause or deficiency.
Cancer that causes the bone marrow to release a higher volume of white blood cells that are not yet mature or are abnormal; this can also cause anemia.

Increase in white blood cells that can be caused by a bacterial infection.
Platelet Diseases

Thrombocytopenia

WHERE ARE THE PLATELETS??

A decrease or lack of platelets in the blood that can be caused by an autoimmune disease.

Primary Thrombocythemia

An increase in production of platelets that can cause many diseases like von Willebrand disease, which is where your blood doesn't clot normally.
What is Pathology?
https://www.rcpath.org/discover-pathology/what-is-pathology.html

Types of blood cells
https://www.ncbi.nlm.nih.gov/books/NBK2263/

Red Blood Cell diseases
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White Blood Cell diseases
https://www.merckmanuals.com/home/blood-disorders/white-blood-cell-disorders/overview-of-white-blood-cell-disorders

Platelet Diseases
https://emedicine.medscape.com/article/201722-overview