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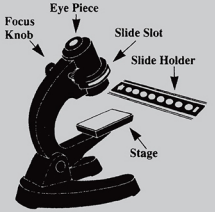
MICRO-SLIDE-VIEWER™



Face the Micro-Slide-Viewer so that as much light as possible falls on the white Stage.

Insert the numbered end of the Slide Holder into the Slide Slot of your Viewer, moving it from your right to left.

View with your eye close to the Eye Piece.

With Slide No. 1 in place, focus by turning the Focus Knob.

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6 FIBRIN - Washed clot - (400x)

Look for a network of fibrin threads. These threads change liquid blood into a clot that stops bleeding at wounds. It is not a simple process. The complicated chemical activities help to prevent clot formation at the wrong place or wrong time. Such clots cause strokes or heart attacks. Let us read a simplified description of the steps in blood clotting.

Injured cells release enzymes. Platelets (Microslide 1, (Pt)) become sticky and they too release enzymes. These enzymes are called THROMBOPLASTINS. They (helped by calcium ions and other chemicals) change PROTHROMBIN into active THROMBIN. Active THROMBIN changes soluble FIBRINOGEN into threads of FIBRIN protein. The threads form a clot that is red because of trapped red cells. Normal blood will cot in about 4 minutes.

Hemophilia is an inherited blood disease. Anti-clotting chemical in the blood prevent clotting. Victims may bleed to death from slight injuries.

7 SICKLE CELLS - Smear, stained - (100x)

The abnormal sickle cells (S) get their shape because of a defect in the hemoglobin. In one tiny place in the molecule it has the amino acid VALINE instead of glutamic acid. The blood tends to become thicker so that it can't pass through capillaries easily. It is an inherited defect of blood found mostly among Blacks.

A person inherits this defect from both parents. Many of his sickled cells break and die, the patient becomes anemic. A person who inherits the defect from one parent can lead a normal life. However, if he marries another person with the same defect they my have anemic children.

8 INFECTED BLOOD - Smear, stained - (800x)

You have learned that blood is inherited part of the body. Just as any other part, it can also become infected. Among the red cells are the blue-stained trypanosome protozoa (T). They cause sleeping sickness. The protozoa are carried harmlessly in wild African animals. The tsetse fly spreads the disease to humans. It sucks blood from the animals. When it attacks a human it injects the trypanosomes along with its saliva. It is a dangerous infection and, unfortunately, even our white corpuscles cannot develop a defense against this disease.

Photomicrographs #2, #4-Electroscan by Edward W. Dempsey, Dept. of Anatomy, College of Physicians and Surgeons, Columbia University; #3, 5, 6 & 7 by Herbert A. Nestler, Hofstra University.

SET 95

HUMAN BLOOD

In a human body, about 5 quarts of blood move through a network of more than 60,000 miles of pipelines made up of arteries, capillaries and veins. This life-giving fluid serves trillions of customers, the tissue cells of the body. The blood delivers heat, water, oxygen, hormones, nutrients, and anti-bodies to all parts of the body. It removes harmful wastes from the cells. It defends the body against disease. Blood is important in the body's homeostasis (HOme-oh-STAY-sis). This means that it tends to regulate the environments that surround the body cells. These chemical and physical environments help to control the activities of the living cells.

This set allows you to examine the different parts of human blood and learn something about how it performs its vital functions.

The magnification given, for example Microslide 1 - (900x) means that the microscope was set at that power when the photograph was taken.

1 HUMAN BLOOD SMEAR - Stained - (900x)

The first thing you notice in Microslide 1 is that blood is not a simple red liquid. It is made up of many different parts. Some of these parts are: PLATELETS (Pt); RED CORPUSCLES (R); white corpuscles of two types, POLYMORPHONUCLEAR LEUCOCYTE (POLY-more-fo-NEW-cle-ur LOO-ko-site) (Po) and LYMPHOCYTE (L). In between the cells you can see a lightly stained film of PLASMA (PL), the liquid part of blood. In our bodies, plasma is pale yellow and looks like the fluid in a sunburn blister. Its appearance is simple, and it is about 90% water, but it is a very complex solution. Except for oxygen, it is the main carrier of all other needs and wastes of the body cells. It has many different kinds of proteins. Some are GLOBULINS that help the development of immunity against disease. There are ALBUMINS that help maintain blood pressure, and FIBRINOGEN that is needed for the clotting of blood. In addition, there are many enzymes and minerals that help to regulate cell activities. Blood tastes salty because plasma contains inorganic ions such as Sodium, Potassium and Calcium.

When you see any part of blood mentioned in the following Microslides return to this and other slides for further study.

By HERBERT A. NESTLER