

Blood**Slide 101**

This is a classic slide of blood cells using a Wright stain. Inspect red blood cells and their appearance. Note the approximate size and relationship to other cells. Next, attempt to identify the white blood cells. Neutrophils are the most common type, followed by lymphocytes. Monocytes and eosinophils are significantly less common. Basophils are the rarest of the white blood cells. Look for features such as granules in the cytoplasm, the overall color of the cytoplasm, the shape of the nuclei and the size of the cells. Also notice the much smaller bluish particles called platelets.

Slide 100

This is a blood smear stained with methylene blue. This is a stain that particularly shows reticulocytes. Reticulocytes are red blood cells in which ribosomes can be seen as blue dots in the cytoplasm. When red blood cells are released from the bone marrow they contain some ribosomes for about a day. Since red blood cells live approximately 120 days, what percentage of red blood cells should be reticulocytes? Estimate the percentage of reticulocytes in this particular specimen. What is that likely to indicate about the patient?

Bone Marrow**Slide 103A**

This is a bone marrow smear. First, try to identify the mature blood cells that are present, including red blood cells and neutrophils. Next, try to find some immature red blood cells. These tend to have darkly staining nuclei with a relatively small amount of cytoplasm surrounding them. Notice that some have blue cytoplasm and others are pinker. There are a few larger, round cells with a royal blue, homogeneous cytoplasm. These are proerythroblasts. Then look at the larger cells. Notice that these tend to have very large nuclei, which are often quite irregularly stained, often with nucleoli. These represent blast cells. Notice that many of these have a slightly granular appearance due to accumulating granules. These are part of the granulocytic series. Try to find some with different types of specific granules including eosinophils and basophils.

Slide 103B

This is a punch biopsy from the iliac crest. This is done to evaluate the function of bone marrow and to show the architecture and relationship between developing blood cell components. First, identify areas with bone spicules. These stain pink.

Next, notice that the blood cells are interspersed with fat cells. Estimate the percentage of the marrow occupied by fat, which normally varies by age. Next, look for collections of developing red blood cells. These typically exist near sinusoids as erythroblastic islands. The sinusoids are full of mature red blood cells with no nuclei. The outlines of these mature red cells are not very distinct in this biopsy and the sinusoids look mostly like irregular pink areas. At the center of the erythroblastic islands is a macrophage. The areas between the developing red blood cells contain granulocytic precursors. Finally, look for large cells with multi-lobed nuclei, the megakaryocytes.

Slide 75

Examine the marrow from this section of rib stained with H&E. This slide shows the sinusoids a bit better and also shows more megakaryocytes. Again, notice the cellularity of this marrow (basically the ratio between blood components and fat).

Slide 104

This slide shows a bone marrow aspiration with spicules of bone. Notice that the structure of the bone marrow is not easy to distinguish, although individual cells are quite clear. Attempt to identify a couple of examples of the major stages of granulocyte and erythrocyte development as you did previously in slide 103.

Respiratory System

Slide 167

The lower portion of this slide is the trachea. Examine the structure of typical respiratory epithelium, the lamina propria (with sub mucous glands) and smooth muscle. Notice that the smooth muscle is most prominent on the top left side of the trachea in the specimen. This would be the posterior side of the trachea, near the esophagus (which is also seen in this slide). What kind of cartilage is present here? Notice the perichondrium.

Slide 29

Notice the features of the trachea, including those of the mucosa, lamina propria and cartilage.

Slide 168

This slide shows some larger respiratory passages and blood vessels in the upper left and the parenchyma of the lung. In the upper left try to identify a

bronchus with cartilage plates. Notice its lining (not well preserved). Next, shift your attention to the pulmonary artery, adjacent to it. Identify bronchioles in the lung parenchyma. What is the lining of the bronchioles and what kind of blood vessel is adjacent to these bronchioles? Try to find an example of where a bronchiole becomes a respiratory bronchiole and then alveolar duct. There are several such examples on the specimen. Finally, examine the walls of the alveoli for capillaries. These can be identified because some of them contain ghosts of red blood cells.

Slide 169A & B

These are two wonderful specimens of a trichrome-stained, inflated human lung. Notice the larger blood vessels and bronchi and areas of delicate alveoli. Notice the thinness of the alveolar walls at high power. Try to identify type I and type II pneumocytes and notice that the capillaries contain red-staining red blood cells. Attempt to identify bronchioles and the transition between bronchioles and alveoli (respiratory bronchioles and alveolar ducts). How does the structure of the wall of bronchioles differ from that of a bronchus?

Slide 170

This is the best slide of the collection for examining the structure of the alveolar wall. Try to visualize type I and type II alveolar cells (pneumocytes), the capillaries which are very well preserved, and even the macrophages in the alveoli. Look for bronchioles and the small arteries and veins. What makes up the blood-air barrier?

Slide 171

Blood vessels in the specimen have been injected. The large ones are very brown while small capillaries can be seen to contain red blood cells that have a grayish appearance.

Integument & Breast

Slide 33

Study the skin as an organ. This slide is of thick skin with heavily keratinized epidermis. Examine the layers of the epidermis. Notice the dermis consisting of connective tissue. Notice that the connective tissue is less dense at the papillae extending into the epidermis, and slightly denser at a deeper level. Look for the location of blood vessels and examine the ducts of sweat glands. These glands themselves are mostly in the superficial fascia which contains much adipose tissue. Nerves and larger blood vessels can be seen within the superficial fascia.

Slide 58

This slide from the scalp has the same general features as the last slide, although there is much less keratin. Examine the hair follicles. There are root sheaths and there is a hair bulb. Sections of hairs have can be seen in a couple of places. Try to identify sebaceous glands. What kind and mechanism of secretion do these glands exhibit., Look for arrector pili smooth muscles.

Slide 194

This is a section from the axilla. The epidermis is at the bottom of the section. Proceeding from this area notice ducts extending into the dermis. Upon reaching the superficial fascia notice the multiple profiles of the sweat glands in the area. How do these differ from the sweat glands in the first skin slide? What is the mechanism of secretion of these glands? Finally, notice the fat in the superficial fascia.

Slide 197

This is a slide through the lip. Try to define the mucocutaneous boundary between the skin on the outer side of the lip and the mucosa covering the inside of the lip. This is a common area for cancer to develop. Also notice the hair follicles (with sebaceous glands), salivary glands and skeletal muscle contained within the lip.

Slide 192

This is a slide through an inactive mammary gland of a monkey. Most of the cells are duct cells with dense connective tissue in between. There is little fat tissue in monkey breast.

Slide 195

An inactive human breast shows connective tissue and fat with scattered ducts. The amount of connective tissue in this case suggests this is from a postmenopausal woman. There is no evidence of active secretory alveoli which would have to grow from the ducts under the influence of hormones.

Slide 196

This is an actively secreting mammary gland. There is milk within the alveoli and within the ducts. Notice that the lumens of the glands are quite large in

comparison to those seen in the digestive glands such as the salivary glands or pancreas. What is the mode of secretion of milk in the lactating breast?