LABORATORY EXERCISES FOR CONNECTIVE TISSUES

Connective Tissue Cells

Slide #124 (K9 1 151A). Lymph node, dog.

The organelle normally occupies the perinuclear area is the Golgi apparatus or complex.
Slide #2 (R-H-93). Skeletal muscle and adipose tissue, rat.

- Nerve, muscle, and brown fat
- Relatively large, oval/elongated, and typically acidophilic-staining cells
- Mast cells
- Granules

Look here
Slide #2 (R-H-93). Skeletal muscle and adipose tissue, rat.

relatively large, oval/elongated, and typically acidophilic-staining mast cells
Mast cells are connective tissue cells that release granules that contain chemicals like histamine and heparin which act in immediate hypersensitivity reactions.

Mast cells and anaphylactic shock
organelle normally occupies the perinuclear area is the Golgi apparatus or complex.

**Plasma cells**

**Golgi apparatus or complex**
Slide #124 (K9 1 151A). Lymph node, dog.

- Lymphocytes
- Neutrophils
- Plasma cells
- Macrophages
Slide #124 (K9 1 151A). Lymph node, dog.

- Lymphocytes
- Neutrophils
- Macrophage
Plasma cells produce immunoglobulins (antibodies) to provide immunity to the cornea and conjunctiva of the eye.

Secretory product is serous with spherical nuclei and red cytoplasm.

Shape of unit is acinar.
Plasma cells produce immunoglobulins (antibodies) to provide immunity to the cornea and conjunctiva of the eye.

Secretory product is serous with spherical nuclei and red cytoplasm. Shape of unit is acinar.
Smaller ducts have simple cuboidal or simple columnar epithelium.
Large ducts have stratified cuboidal or stratified columnar epithelium.
Plasma cells can be seen in the CCT immediately below the epithelium.
Neutrophils also can be seen in the CCT immediately below the epithelium.

Nonkeratinized stratified squamous
Eosinophils have distinctly acidophilic cytoplasm, more so than neutrophils. Neutrophils have lightly acidophilic cytoplasm and in some cases you don’t see the cytoplasm at all in the tissue. Neutrophils tend to have a more segmented nucleus than the eosinophils. Eosinophils tend to have bi-lobed nuclei but it is possible to see them with a tri-lobed nucleus.
apoptosis—review the meaning of this term and how apoptosis differs from necrosis.

Within the epithelium are large, rounded, acidophilic cells with nuclear fragmentation and white “halos”.
apoptosis—review the meaning of this term and how apoptosis differs from necrosis.

Within the epithelium are large, rounded, acidophilic cells with nuclear fragmentation and white “halos”.
DEMOSLIDE BOX 230 – Small intestine, sheep.

You can see eosinophils—(note the acidophilic cytoplasm), neutrophils and lymphocytes.

Peyer’s patches.
DEMO SLIDE BOX 59 – Encysted parasite in liver.
1. eosinophils—note the acidophilic cytoplasm.
2. plasma cells—the characteristic features of these cells are easily observed in this section.
3. macrophages—the cells in this section have phagocytosed hemosiderin, so the cytoplasm is filled with this yellowish-brown pigment. 30
4. fibroblasts
DEMO SLIDE BOX 59 – Encysted parasite in liver.
lymphocytes, macrophages, and multinucleated giant cells
nodular necrobirosis. Notice the large infiltration of eosinophils (use your fine focus to observe the large eosinophilic granules
Connective Tissue

Mesenchyme

Connective Tissue
Mesenchyme
connective tissue observed in this slide is immature and is termed **mesenchyme**; it is the forerunner of most mesodermally derived tissues in the body, including collagenous connective tissue.
The connective tissue observed in this slide is immature and is termed **mesenchyme**; it is the forerunner of most mesodermally derived tissues in the body, including collagenous connective tissue.
Slide #133- Fetus, placenta and uterus, mouse.

- Mesenchyme
- Nucleated RBC
Collagenous Connective Tissue
Slide #71 (Pf5-73/205). Esophagus and trachea, pig.

- Mucous
- Ground substance
- Nonkeratinized stratified squamous
- Collagenous connective tissue
Slide #10 (926). Skin, monkey.
Reticular Connective Tissue

Slide #125 (K9-1-151A retic). Lymph node, dog.

reticular fibers are black.
DEMO SLIDE BOX 175 (C003-H-86) – Lymph node, dog.

Reticular cells
Slide #59 (1036). Lymph node, dog.

- Collagenous Connective Tissue (CCT)
- Unilocular adipose tissue or white fat
Slide #59 (1036). Lymph node, dog.

Collagenous Connective Tissue (CCT)
Slide #59 (1036). Lymph node, dog.

- lymphocytes
- reticular connective tissue (CT)
- macrophages (large cells with pink cytoplasm)
Elastic Connective Tissue
Mucous Connective Tissue

DEMO SLIDE BOX 201(GT-1-177) - Umbilical cord, goat.

Diagram showing:
- Umbilical artery
- Umbilical vein
- Allantois
- Umbilical artery
- Transitional epithelium
unilocular (white) adipose tissue. Scan the section on low magnification, noting the “chicken-wire” appearance.
Adipose Tissue

DEMO SLIDE BOX 160 (1106)—Blood vessels, pig.

unilocular (white) adipose tissue. Note young fat cells that contain central nuclei and several small droplets that have not yet coalesced into an unilocular unit.
- Skin and footpad, cat.

- Keratinized stratified squamous epithelium
- Collagenous connective tissue
- Simple cuboidal epithelium in sweat glands
- Simple squamous epithelium lining blood vessels

unilocular adipose tissue.
Note young fat cells that contain central nuclei and several small droplets that have not jut coalesced into an unilocular unit.
Slide #142 (52 Rat). Long bone, rat.

megakaryocytes within the red marrow. They make platelets
White or unilocular: one large lipid droplet in each cell which has pushed the nucleus to the periphery and flattened it.
Brown or multiloculated: multiple lipid droplets in each cell and centrally located nucleus
Identify the surface epithelium, CCT under the epithelium,
Identify the surface epithelium, CCT under the epithelium, and the layer of unilocular adipose tissue that is deep to the CCT.
LABORATORY EXERCISES FOR CARTILAGE

Hyaline Cartilage
**DEMO SLIDE BOX 181—Comb and nasal cavity, chicken (954).**

Chondroblasts are located just below the perichondrium and appear as flattened cells. Chondrocytes within lacunae. You may be able to see only the nuclei of the cells, as the cytoplasm may have undergone considerable shrinkage during preparation. Basophilia of the matrix, especially the matrix immediately surrounding the chondrocytes (this is called territorial matrix).
Fibers and Ground substance both have the same refractive index. This means you can’t visually distinguish fibers from ground substance.
Pseudostratified columnar

Chondrocytes; remember that chondroblasts are on the edges in the perichondrium
Slide #71 (Pf5-73/205). Trachea & esophagus, pig.

Chondrocytes; remember that chondroblasts are on the edges in the perichondrium.

Pseudostratified columnar.
Chondrocytes are in the lacunae in the matrix.
Chondroblasts are on the periphery.
hyaline cartilage.

Keratinized and nonkeratinized stratified squamous
Pinna of ear, sheep.

characteristic features of elastic cartilage
This slide is similar to the previous two slides. Examine it for elastic cartilage in sweat gland.

CCT, keratinized stratified squamous epithelium, simple cuboidal epithelium, endothelium.
This slide is similar to the previous two slides. Examine it for

CCT, keratinized stratified squamous epithelium, simple cuboidal epithelium, simple columnar epithelium, endothelium
Fibrous Cartilage (Fibrocartilage)

Slide #7 (F-H-FC). Meniscus, cat.

no perichondrium is present.

Fibrocartilage
Fibrous Cartilage (Fibrocartilage)

Slide #7 (F-H-FC). Meniscus, cat.
Fibrocartilage is found connecting other structures. Here, the fibrocartilage is joining tendon (CCT) to bone.
- Femur, cat.

Fibrocartilage is found connecting other structures. Here, the fibrocartilage is joining tendon to bone.
CELLS OF CT

FIBROBLASTS
MESENCHYMAL CELLS and RBC
ADIPOSE CELLS
MACROPHAGE
PLASMA CELLS
MAST CELLS and WBC

CHONDROBLASTS
CHONDROCYTES

OSTEOBLASTS
OSTEOCYTES
OSTEOCLASTS
TYPES OF CARTILAGE

- HYALINE CARTILAGE
- ELASTIC CARTILAGE
- FIBROCARTILAGE

CHONDROCYTES

Lacunae = “space”