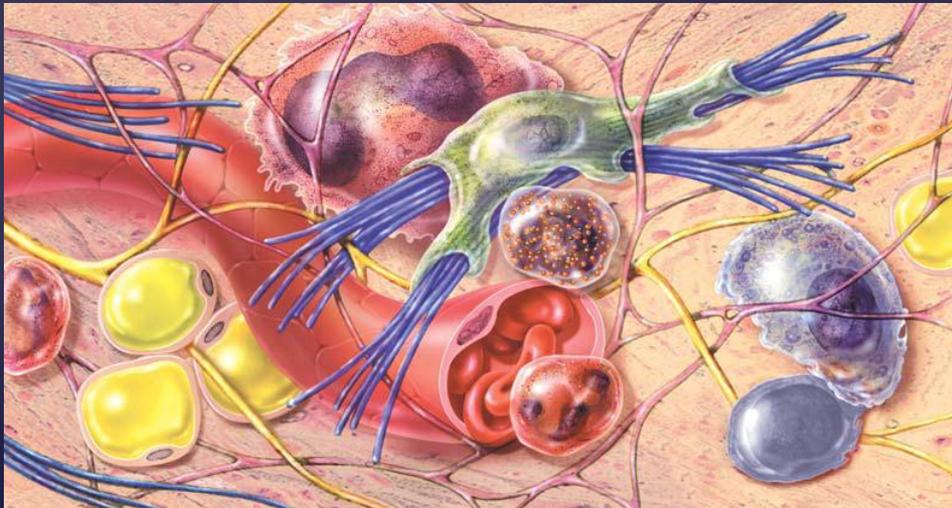
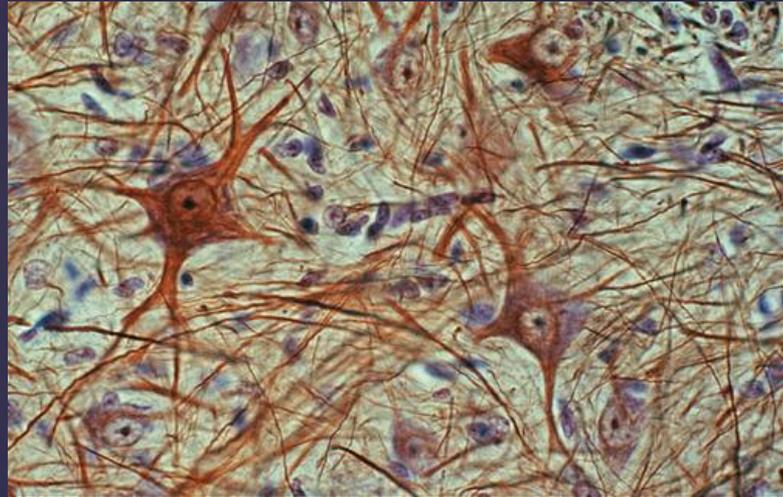


Body Tissues

1. Epithelial Tissue
2. Connective Tissue
3. Muscle Tissue
4. Nervous Tissue



Powerpoint Created By Eddie Hoppe

When looking at a tissue slide you should go through a list of questions to find out what type of tissue you are looking at.

1: Does it line an open space??

If yes, then automatically you know its an epithelial cell.

2: What is the distance between each cell?

Are they stuck together → Epithelial, muscle

Are they widely spaced apart → Bone, cartilage,

Are they close together → Red blood cells

3: What is the cell Shape paired with the cell spacing ?

flat and stuck together → Squamous Epithelial

round and close together → Adipose tissue

lots of fibers in between the cells → Areolar tissue



First
Slide

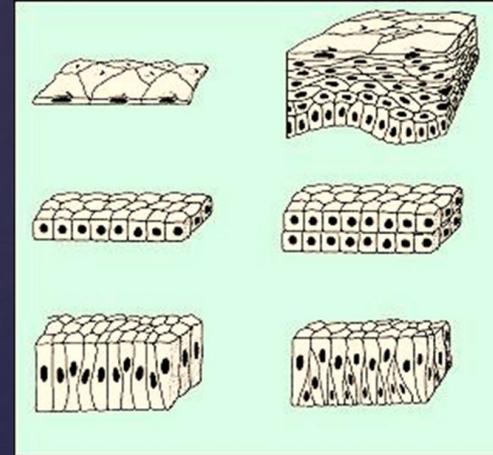


Forward

Epithelial Tissue

Simple

1. [Simple Squamous Epithelium](#)
2. [Simple Cuboidal Epithelium](#)
3. [Simple Columnar Epithelium](#)



Stratified

1. [Stratified Non-keratinized Squamous Epithelium](#)

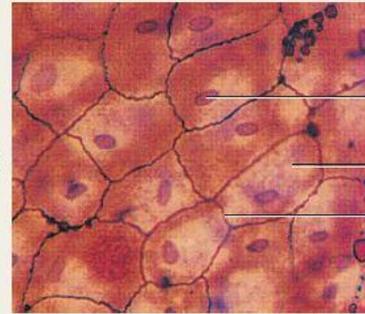
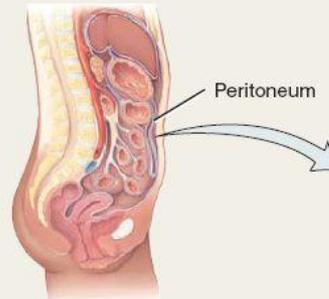
Back

A. Simple squamous epithelium

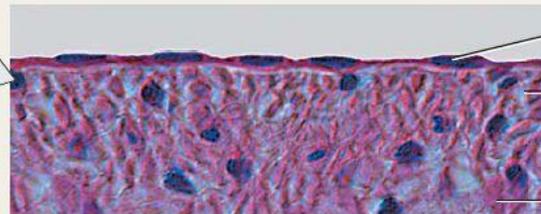
Description: Single layer of flat cells; centrally located nucleus.

Location: Lines heart, blood vessels, lymphatic vessels, air sacs of lungs, glomerular (Bowman's) capsule of kidneys, and inner surface of the tympanic membrane (eardrum); forms epithelial layer of serous membranes, such as the peritoneum, pericardium, and pleura.

Function: Filtration, diffusion, osmosis, and secretion in serous membranes.



Surface view of simple squamous epithelium of mesothelial lining of peritoneum



Simple Squamous Epithelium

Example 1

Back

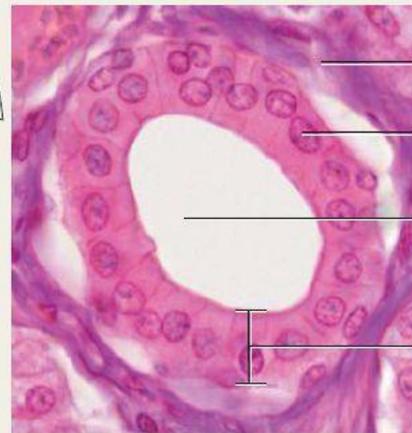
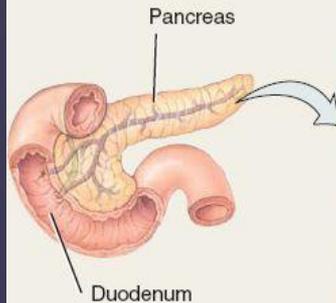
Example 2

B. Simple cuboidal epithelium

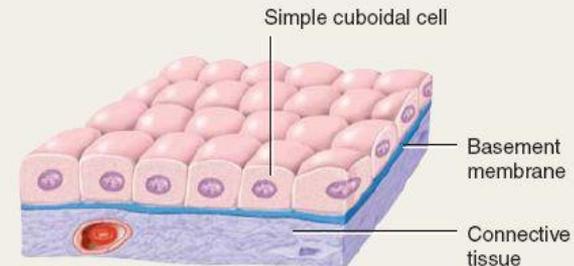
Description: Single layer of cube-shaped cells; centrally located nucleus.

Location: Covers surface of ovary, lines anterior surface of capsule of the lens of the eye, forms the pigmented epithelium at the posterior surface of the eye, lines kidney tubules and smaller ducts of many glands, and makes up the secreting portion of some glands such as the thyroid gland and the ducts of some glands such as the pancreas.

Function: Secretion and absorption.



Sectional view of simple cuboidal epithelium of intralobular duct of pancreas



Simple cuboidal epithelium

Simple Cuboidal Epithelium

Microscope Example

Example 1

Example 2

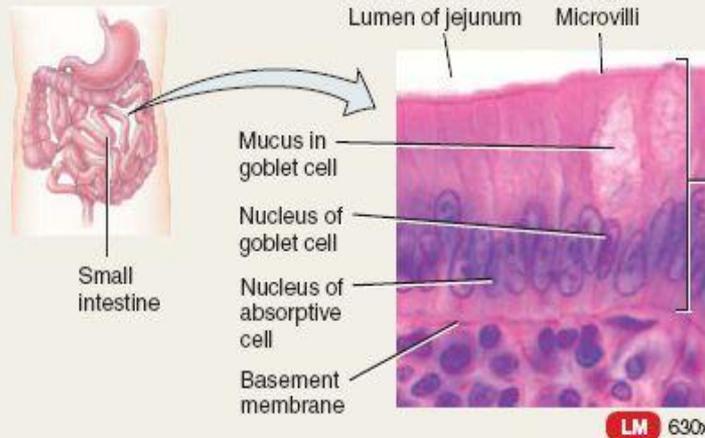
Back

C. Nonciliated simple columnar epithelium

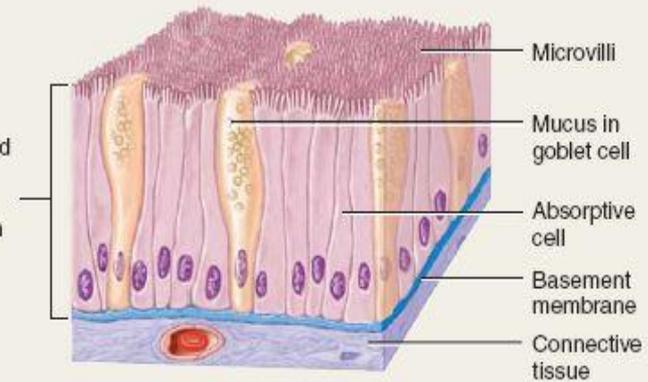
Description: Single layer of nonciliated column-like cells with nuclei near base of cells; contains goblet cells and cells with microvilli in some locations.

Location: Lines the gastrointestinal tract (from the stomach to the anus), ducts of many glands, and gallbladder.

Function: Secretion and absorption.



Sectional view of nonciliated simple columnar epithelium of lining of jejunum of small intestine



Nonciliated simple columnar epithelium

Simple Columnar Epithelium

Microscope Example

Example 1

Example 2

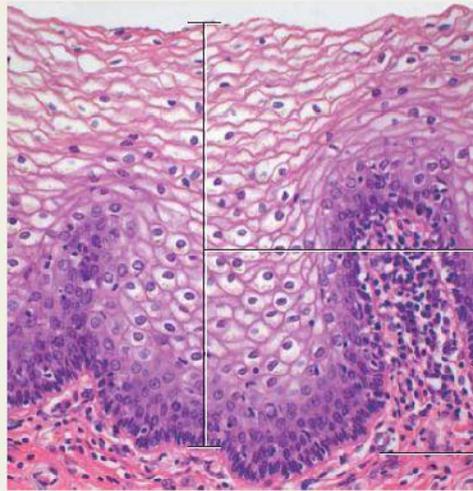
Back

F. Stratified squamous epithelium

Description: Several layers of cells; cuboidal to columnar shape in deep layers; squamous cells form the apical layer and several layers deep to it; cells from the basal layer replace surface cells as they are lost.

Location: Keratinized variety forms superficial layer of skin; nonkeratinized variety lines wet surfaces, such as lining of the mouth, esophagus, part of larynx, part of pharynx, and vagina, and covers the tongue.

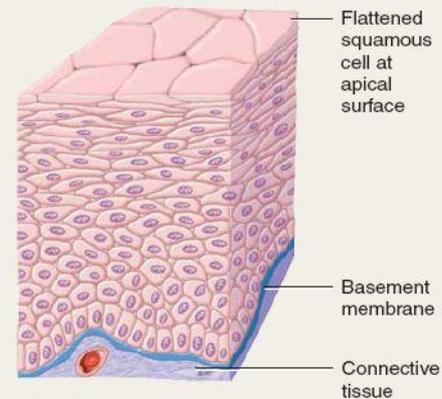
Function: Protection.



Sectional view of stratified squamous epithelium of vagina

Stratified squamous epithelium

Connective tissue



Stratified squamous epithelium

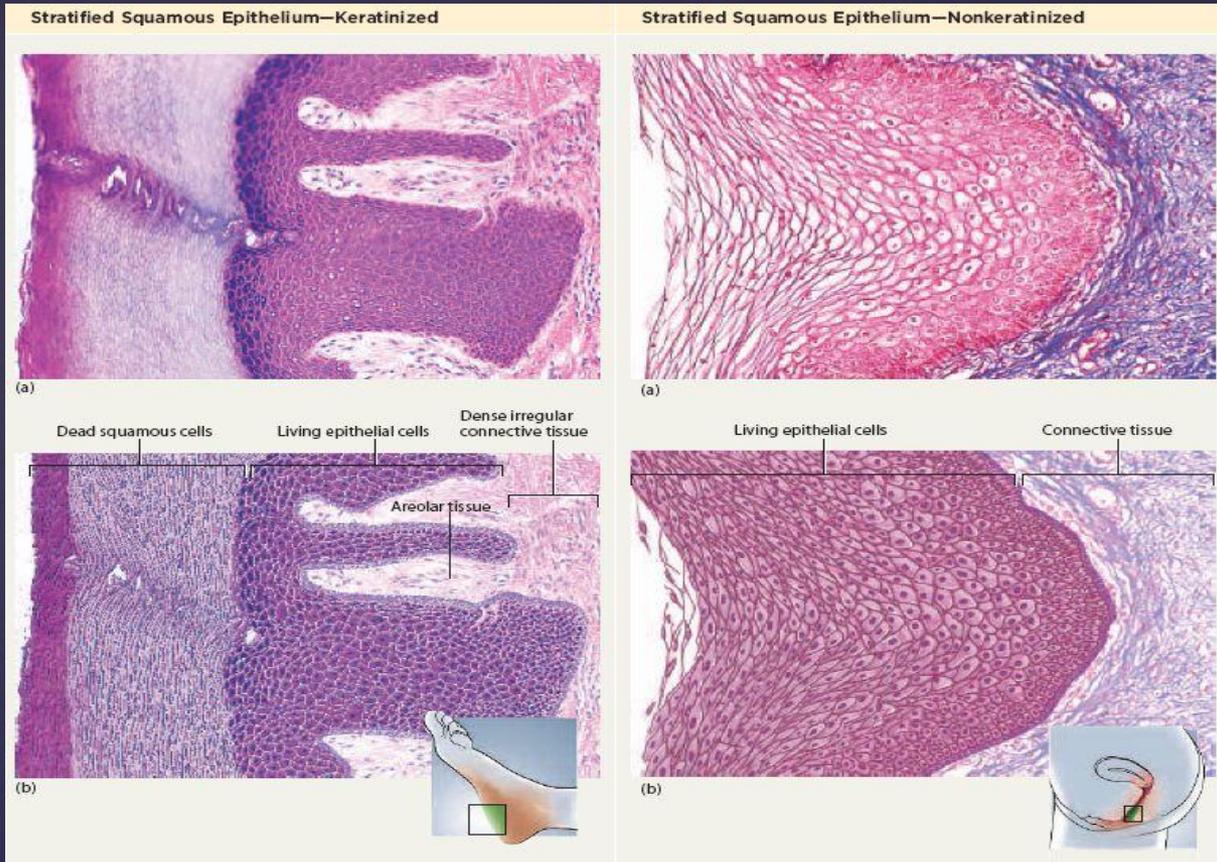
Stratified Non-keratinized Squamous Epithelium

Keratinized Example

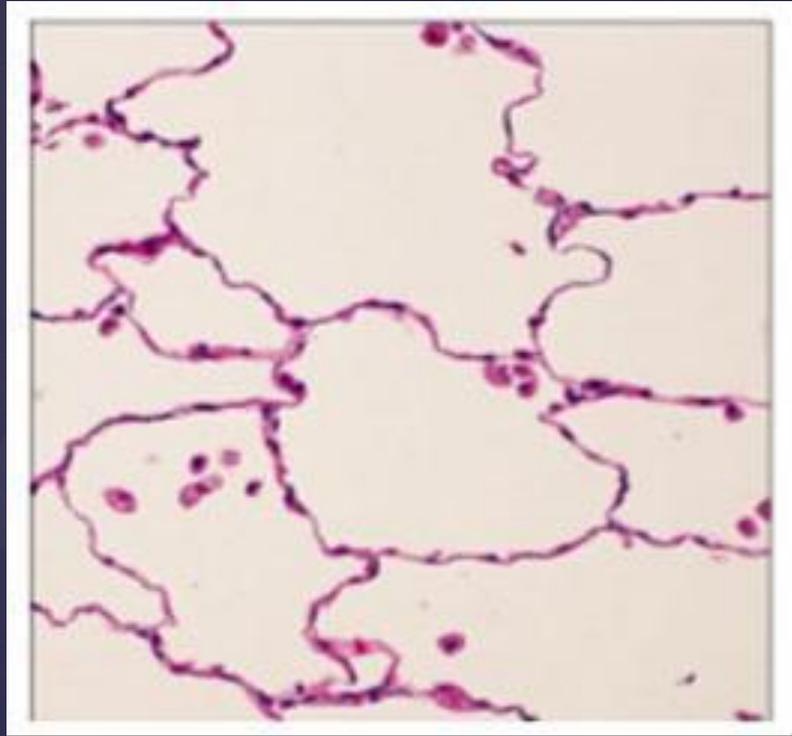
Microscope Example

Back

Other Example

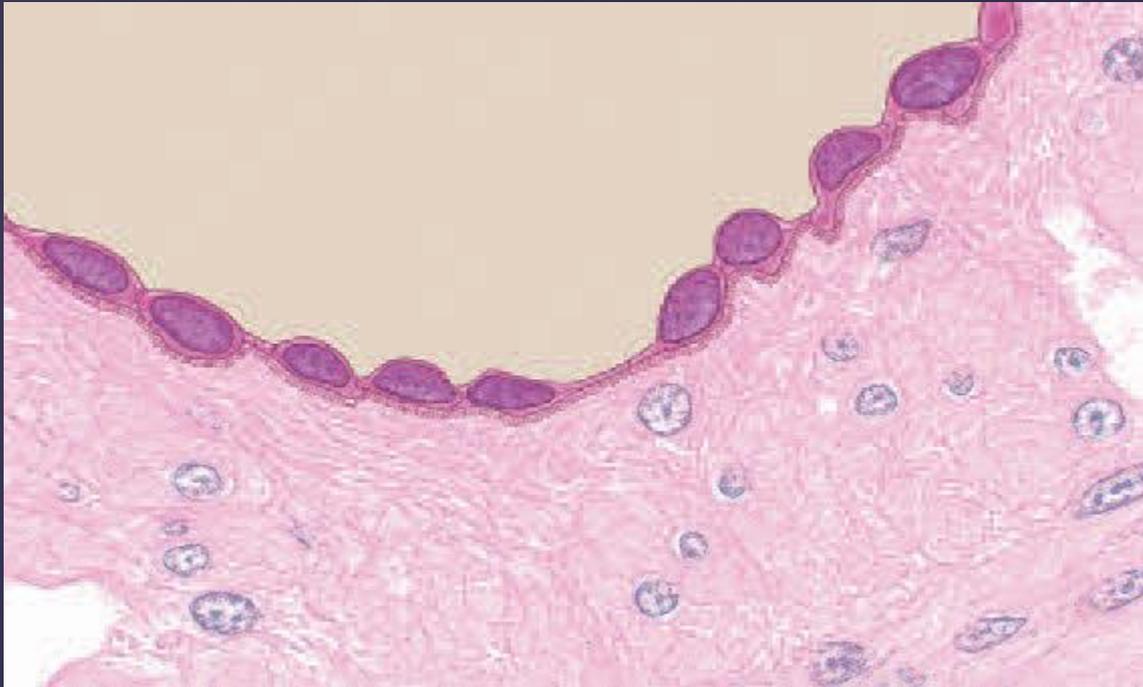


Keratinized vs. nonkeratinized stratified squamous epithelium



Simple Squamous Epithelium





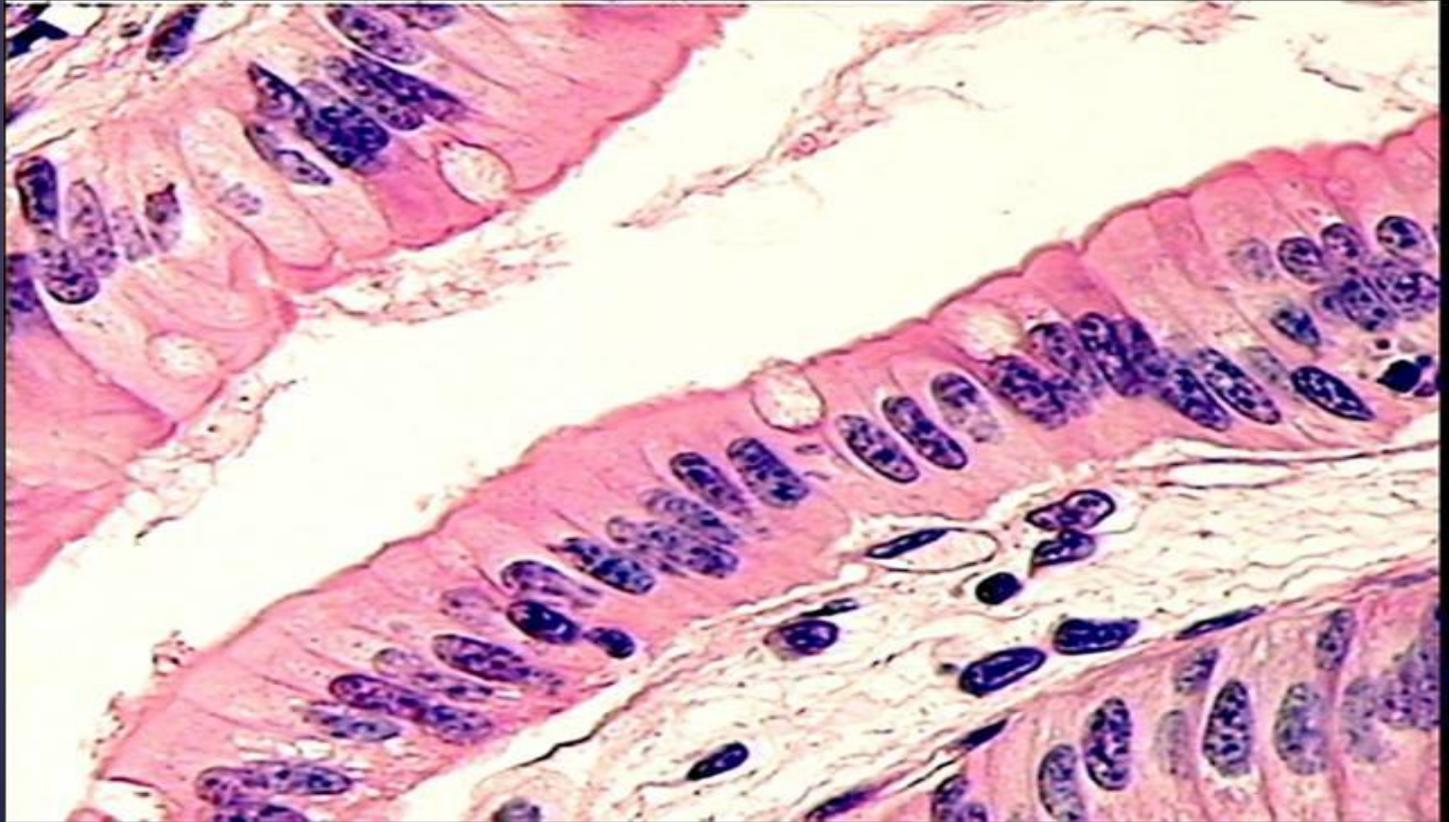
Simple Squamous Epithelium



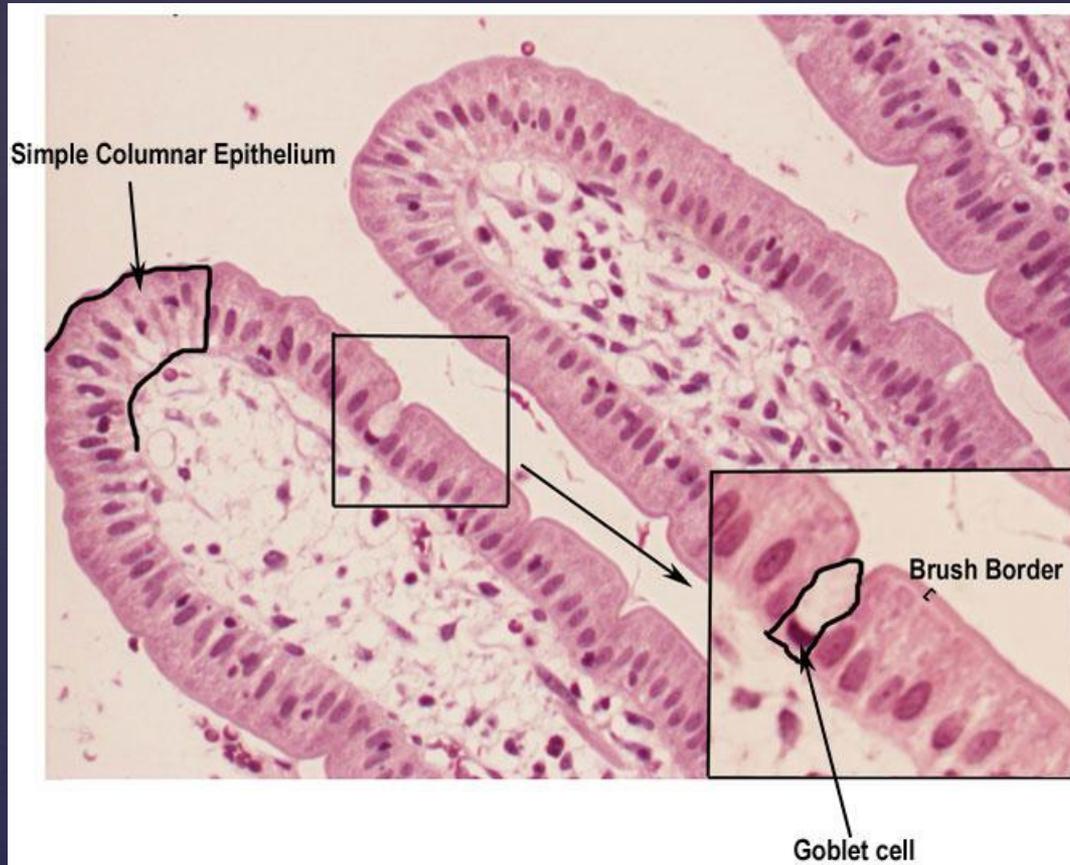


← Back

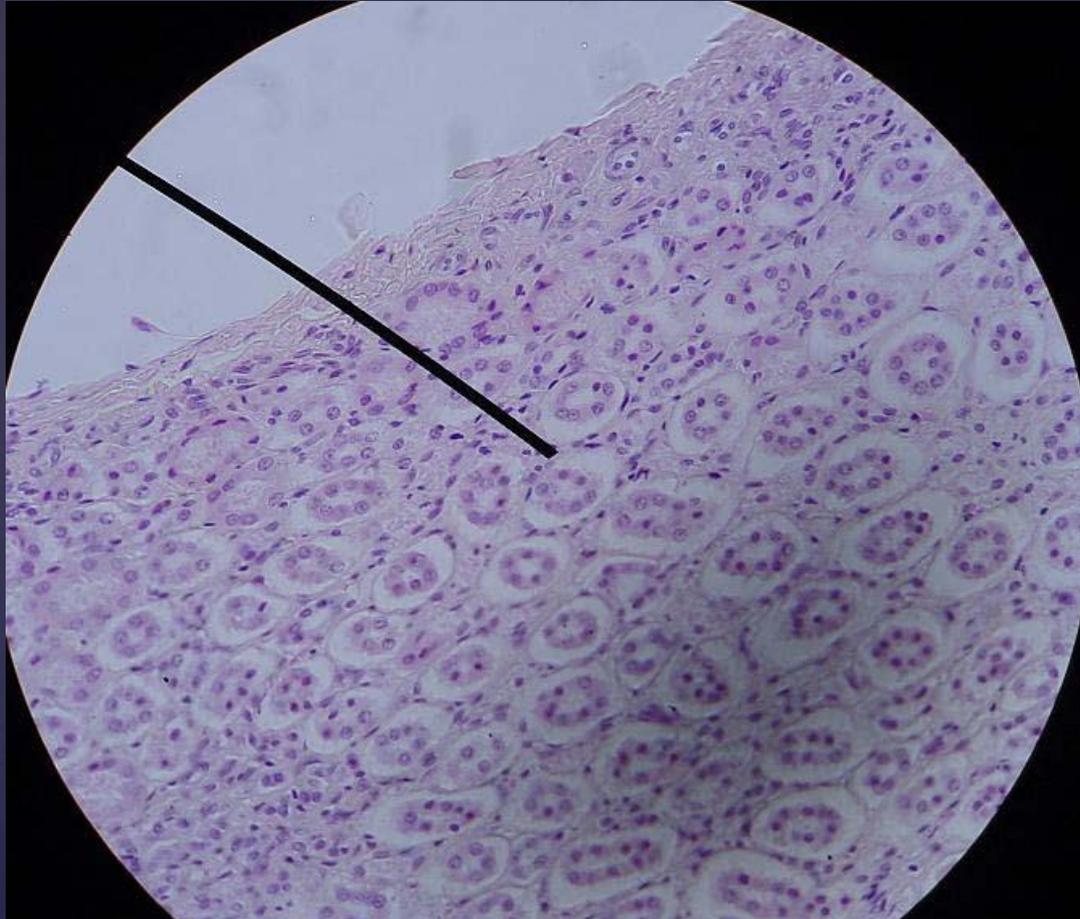
Simple Columnar Epithelium



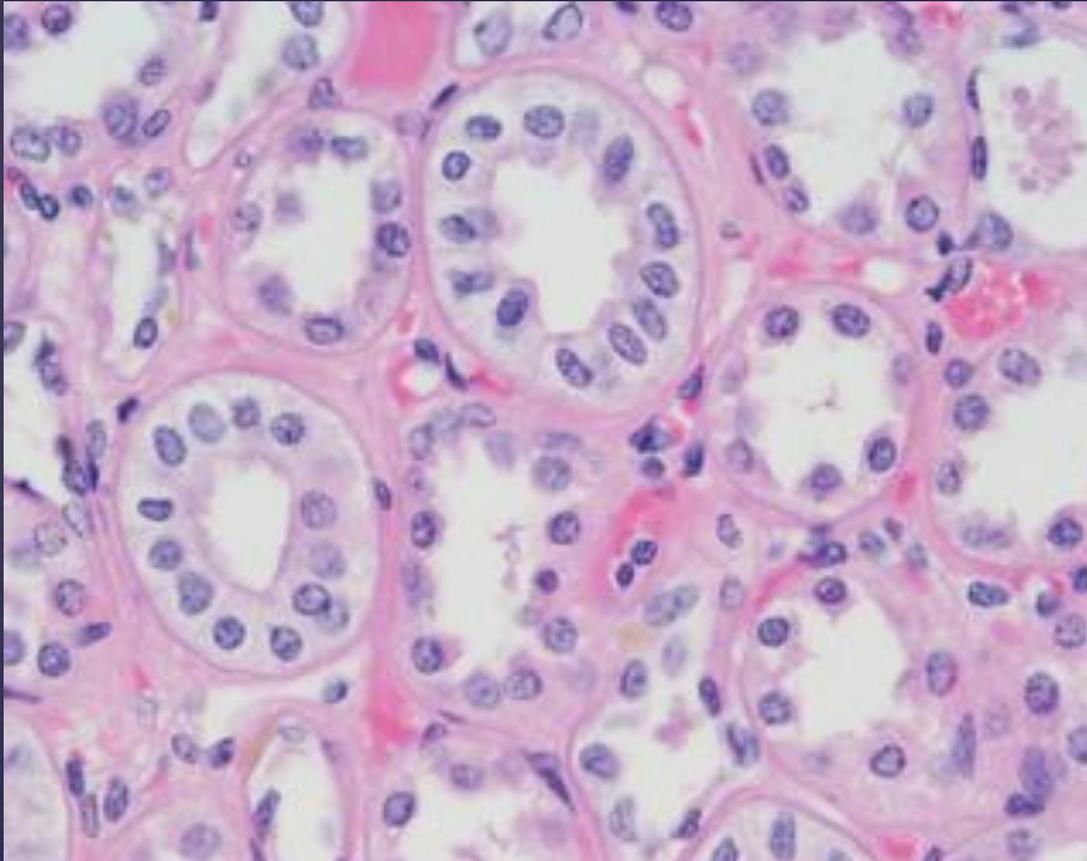
Simple Columnar Epithelium



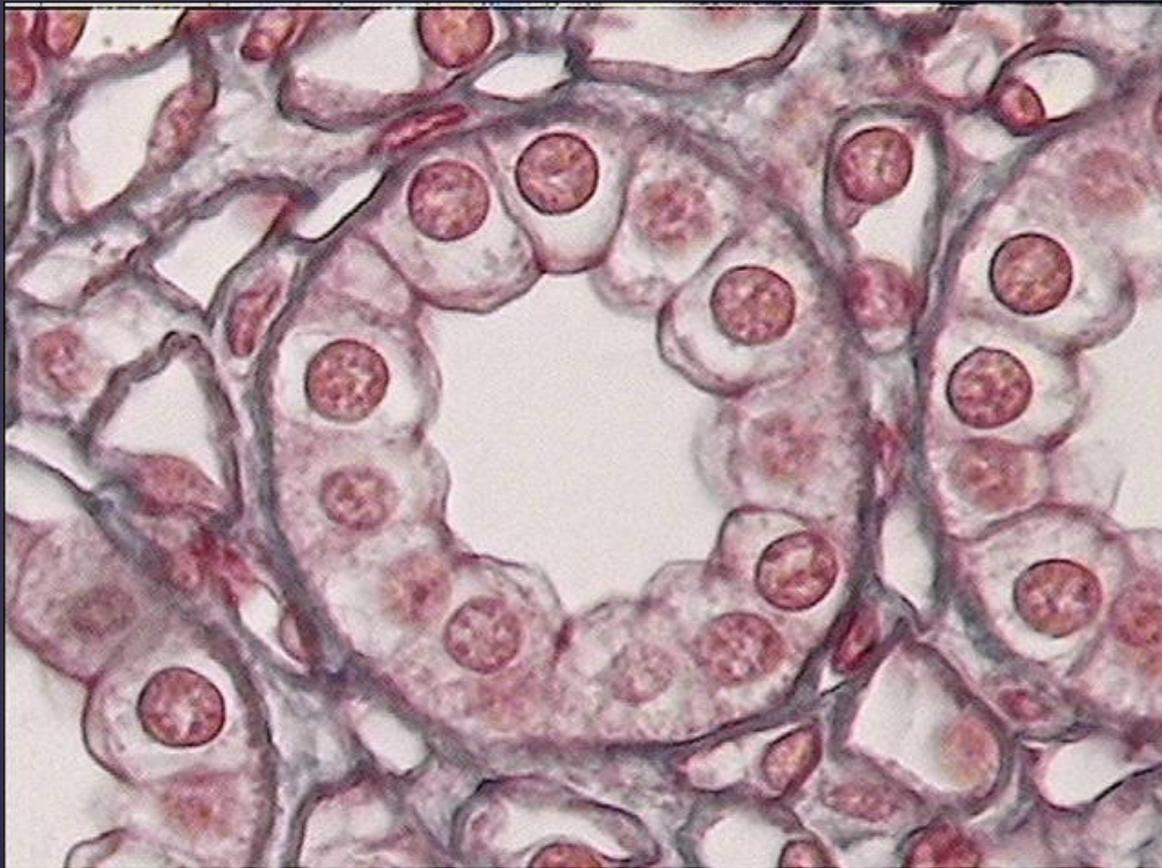
Simple Columnar Epithelium



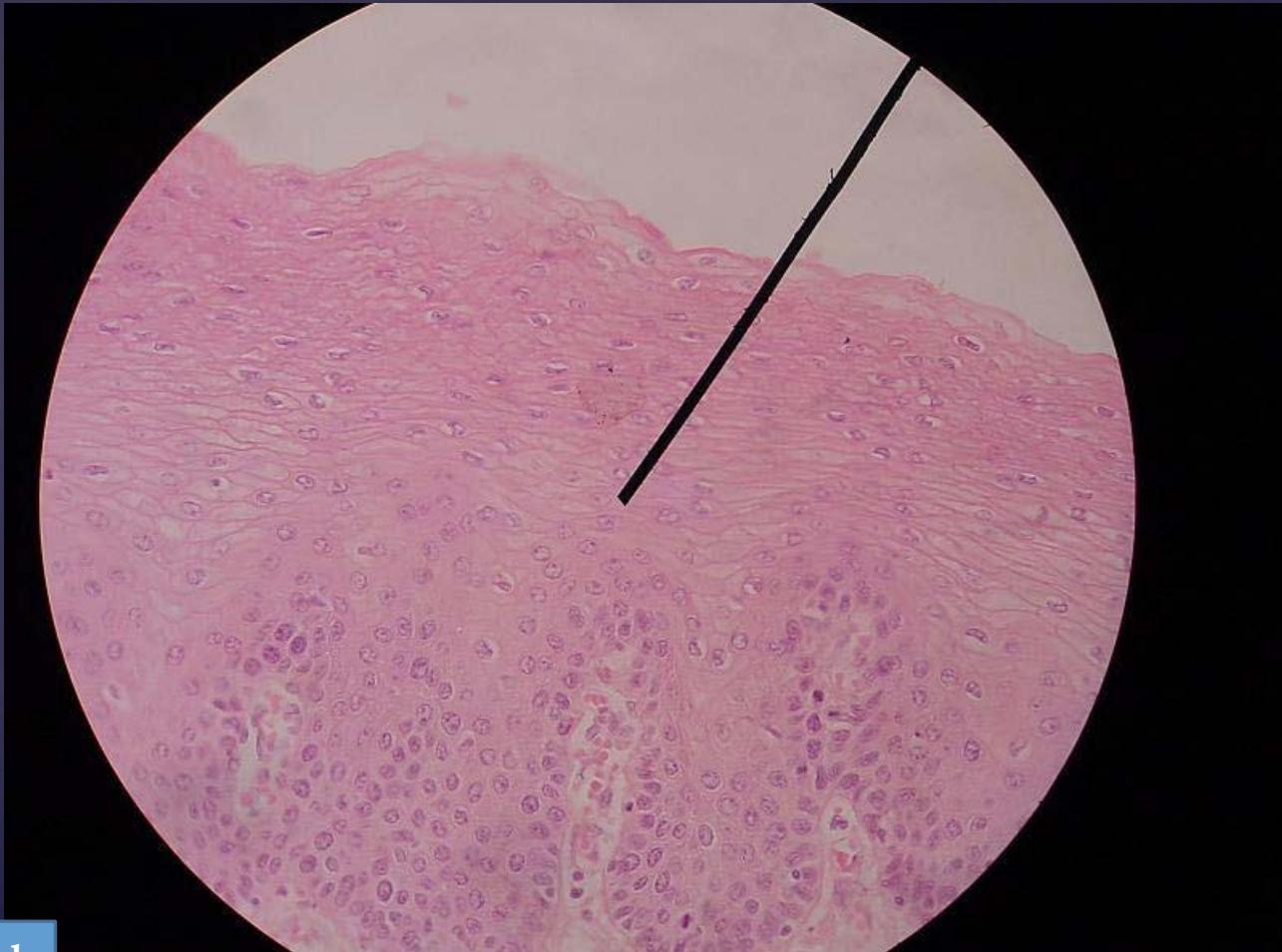
Simple Cuboidal Epithelium



Simple Cuboidal Epithelium

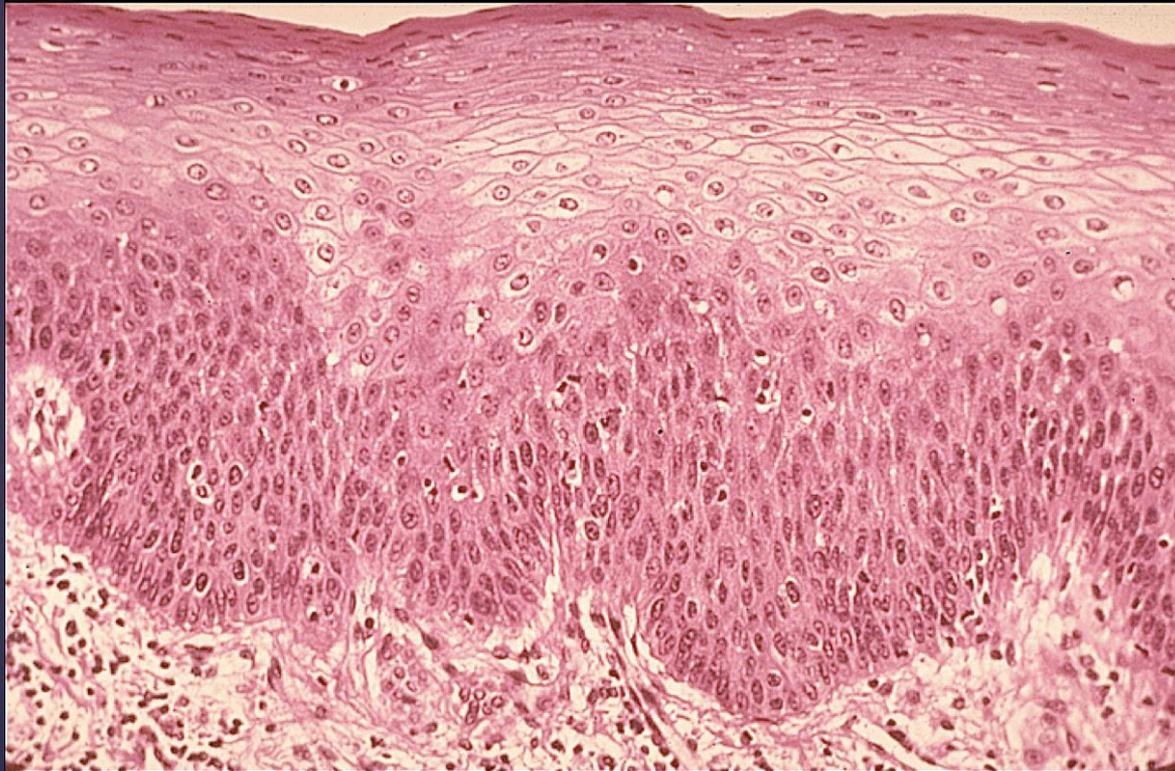


Simple Cuboidal Epithelium



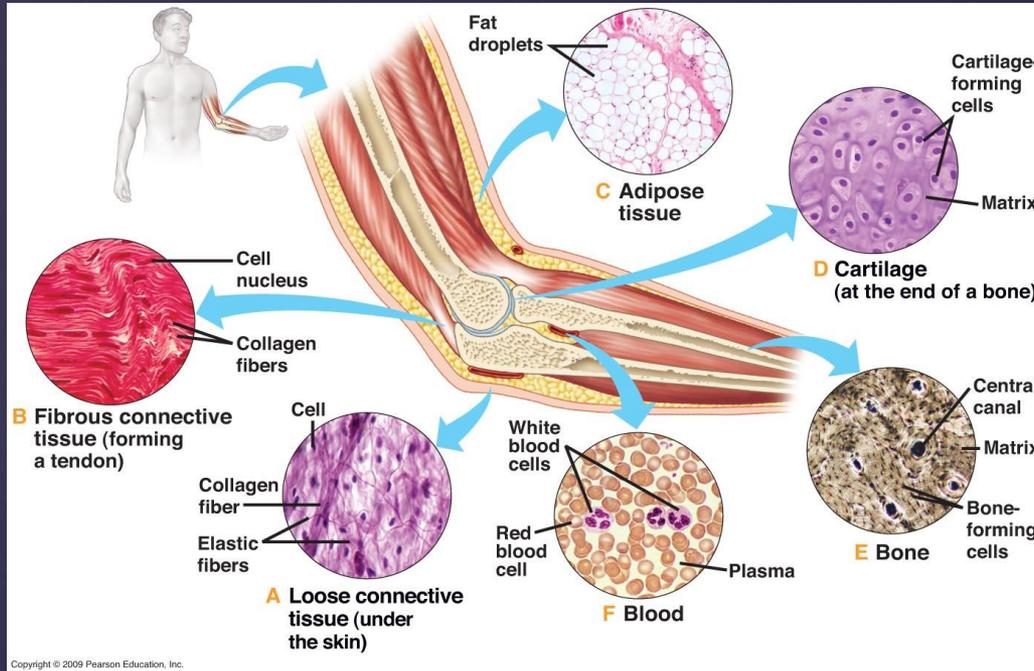
← Back

Stratified Non-keratinized Squamous Epithelium



Stratified Non-keratinized Squamous Epithelium





Connective Tissue

"It's all about the extracellular matrix!"

First Slide

Forward

Mature connective tissue

A. Loose connective tissue

1. Areolar Connective Tissue

2. Adipose Tissue

B. Dense Connective Tissue

3. Dense Regular Connective Tissue

C. Cartilage

4. Hyaline cartilage

D. Bone tissue

5. Osseous Tissue

E. Liquid connective tissue

6. Blood tissue

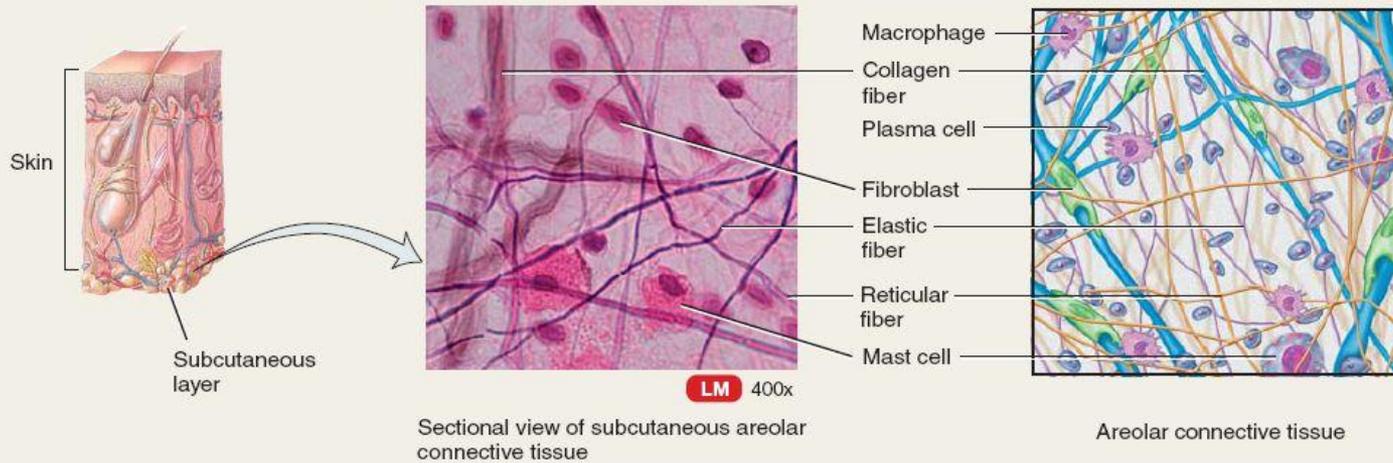


A. Areolar connective tissue

Description: Consists of fibers (collagen, elastic, and reticular) and several kinds of cells (fibroblasts, macrophages, plasma cells, adipocytes, and mast cells) embedded in a semifluid ground substance.

Location: Subcutaneous layer deep to skin; papillary (superficial) region of dermis of skin; lamina propria of mucous membranes; and around blood vessels, nerves, and body organs.

Function: Strength, elasticity, and support.



Loose Connective Tissue

Areolar Tissue

Microscope Example

Back

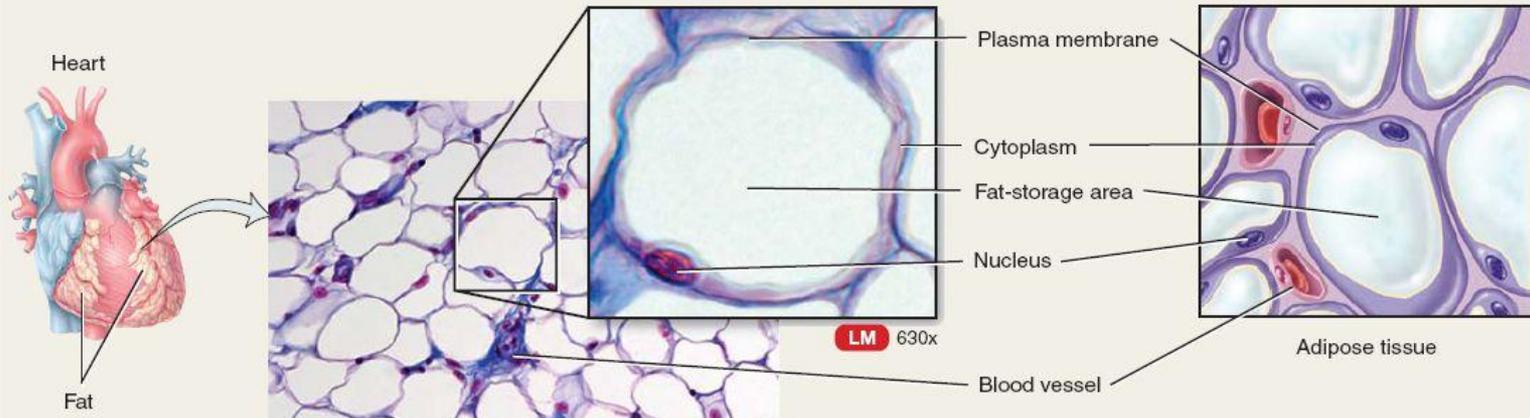
Other Example

B. Adipose tissue

Description: Consists of adipocytes, cells specialized to store triglycerides (fats) as a large centrally located droplet; nucleus and cytoplasm are peripherally located.

Location: Subcutaneous layer deep to skin, around heart and kidneys, yellow bone marrow, and padding around joints and behind eyeball in eye socket.

Function: Reduces heat loss through skin, serves as an energy reserve, supports, and protects. In newborns, brown adipose tissue generates considerable heat that helps maintain proper body temperature.



Loose Connective Tissue

Adipose

Microscope Example

Back

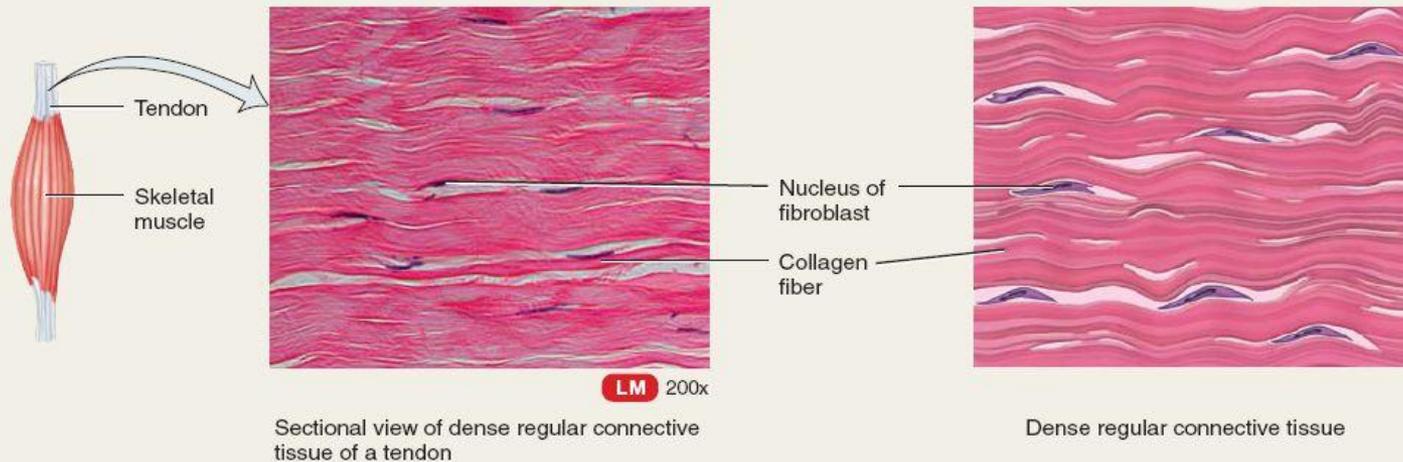
Other Example

D. Dense regular connective tissue

Description: Extracellular matrix looks shiny white; consists mainly of collagen fibers regularly arranged in bundles; fibroblasts present in rows between bundles.

Location: Forms tendons (attach muscle to bone), most ligaments (attach bone to bone), and aponeuroses (sheetlike tendons that attach muscle to muscle or muscle to bone).

Function: Provides strong attachment between various structures.



Dense or Fibrous Connective Tissue Tendon

Back

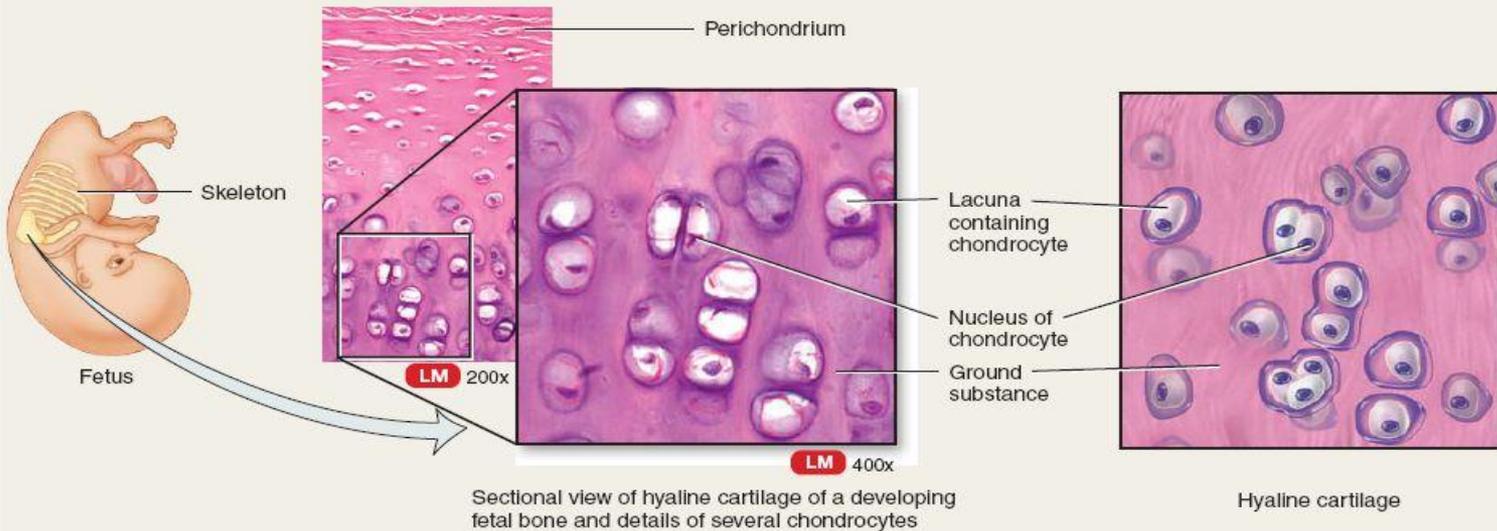
Microscope Example

G. Hyaline cartilage

Description: Consists of a bluish-white, shiny ground substance with thin, fine collagen fibers and many chondrocytes; most abundant type of cartilage.

Location: Ends of long bones, anterior ends of ribs, nose, parts of larynx, trachea, bronchi, bronchial tubes, and embryonic and fetal skeleton.

Function: Provides smooth surfaces for movement at joints, as well as flexibility and support.



Cartilage

Hyaline

Microscope Example

Back

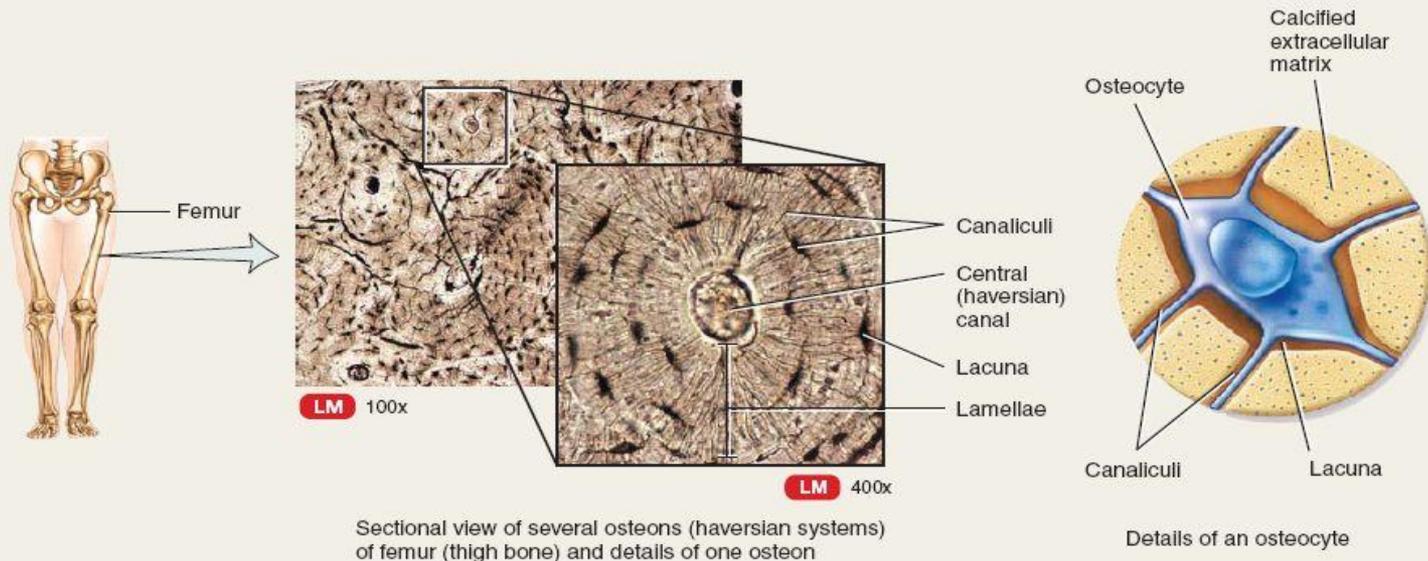
Other Example

J. Compact bone

Description: Compact bone tissue consists of osteons (haversian systems) that contain lamellae, lacunae, osteocytes, canaliculi, and central (haversian) canals. By contrast, spongy bone tissue (see [Figure 6.3](#) on page 180) consists of thin columns called trabeculae; spaces between trabeculae are filled with red bone marrow.

Location: Both compact and spongy bone tissue make up the various parts of bones of the body.

Function: Support, protection, storage; houses blood-forming tissue; serves as levers that act with muscle tissue to enable movement.



Bones

Compact Bone

Microscope Example

Back

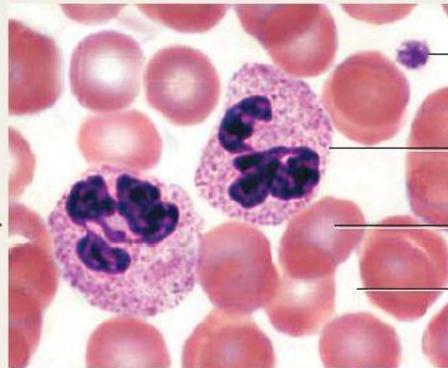
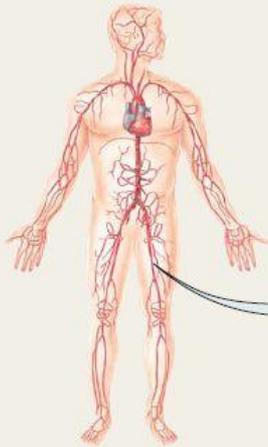
Other Example

K. Blood

Description: Consists of blood plasma and formed elements: red blood cells (erythrocytes), white blood cells (leukocytes), and platelets (thrombocytes).

Location: Within blood vessels (arteries, arterioles, capillaries, venules, and veins) and within the chambers of the heart.

Function: Red blood cells transport oxygen and some carbon dioxide; white blood cells carry on phagocytosis and are involved in allergic reactions and immune system responses; platelets are essential for the clotting of blood.



LM 1230x

Platelet

White blood cell (leukocyte)

Red blood cell (erythrocyte)

Blood plasma



Red blood cells



White blood cells



Platelets

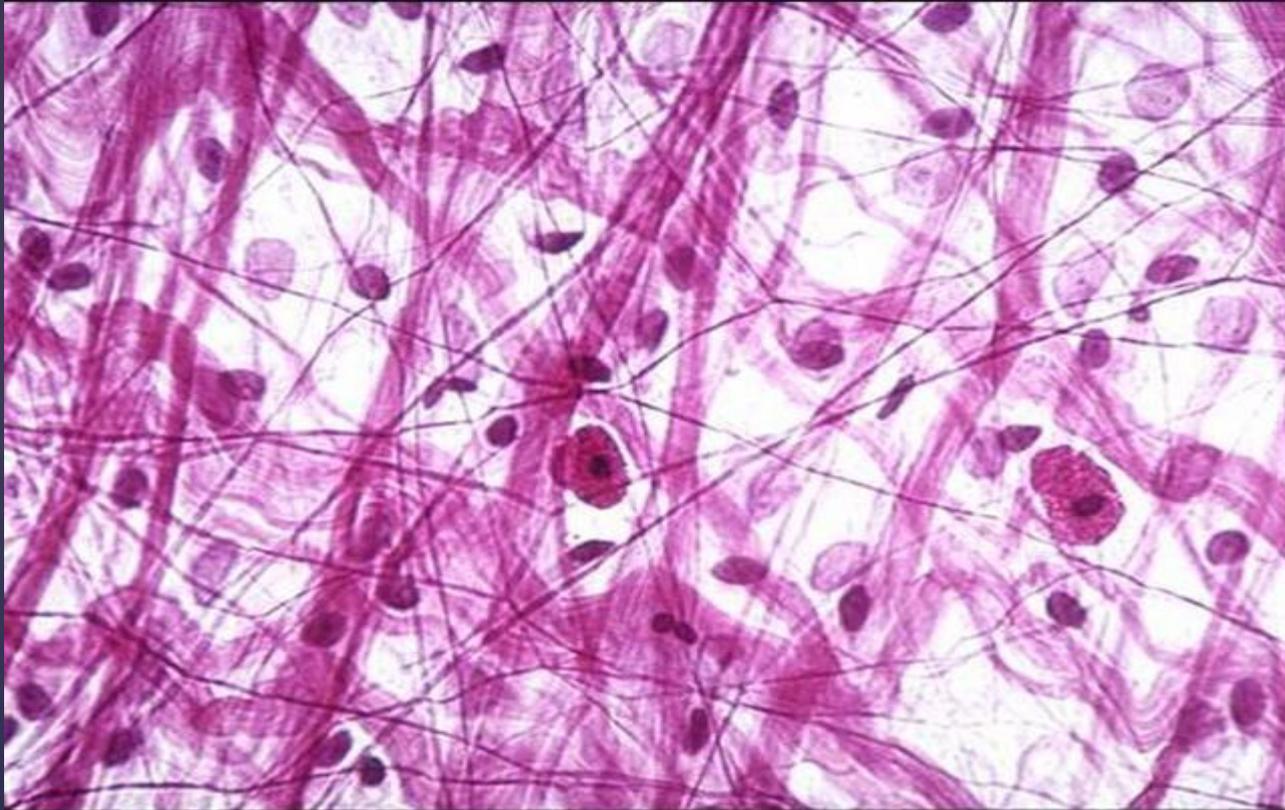
Liquid Connective Tissue

Blood

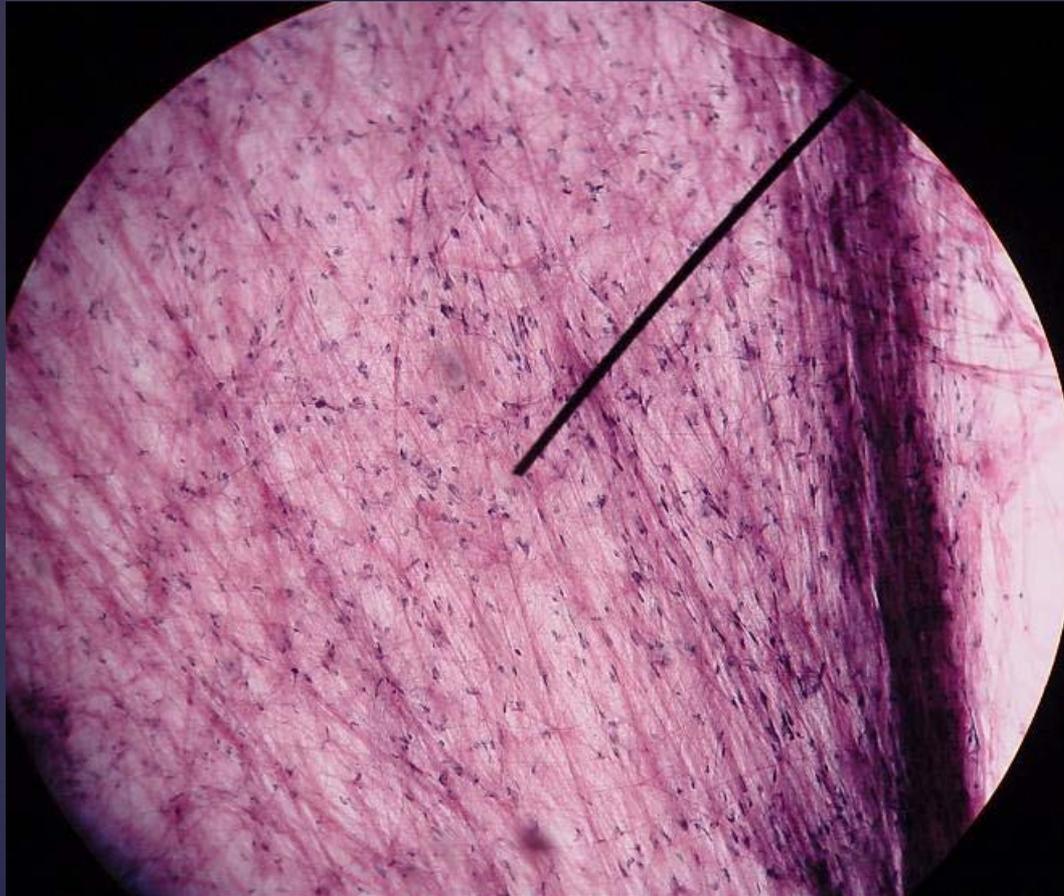
Microscope Example

Back

Other Example

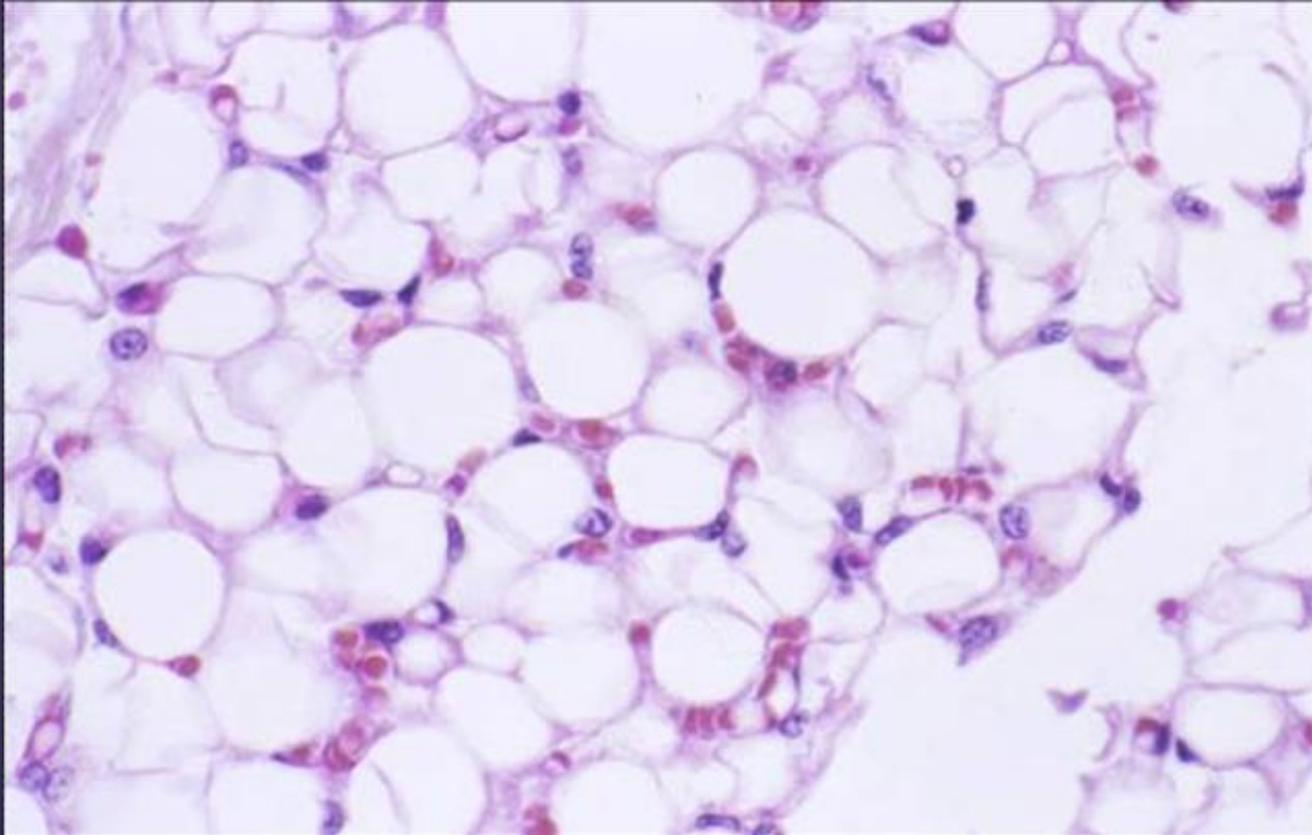


Loose Connective Tissue - Areolar



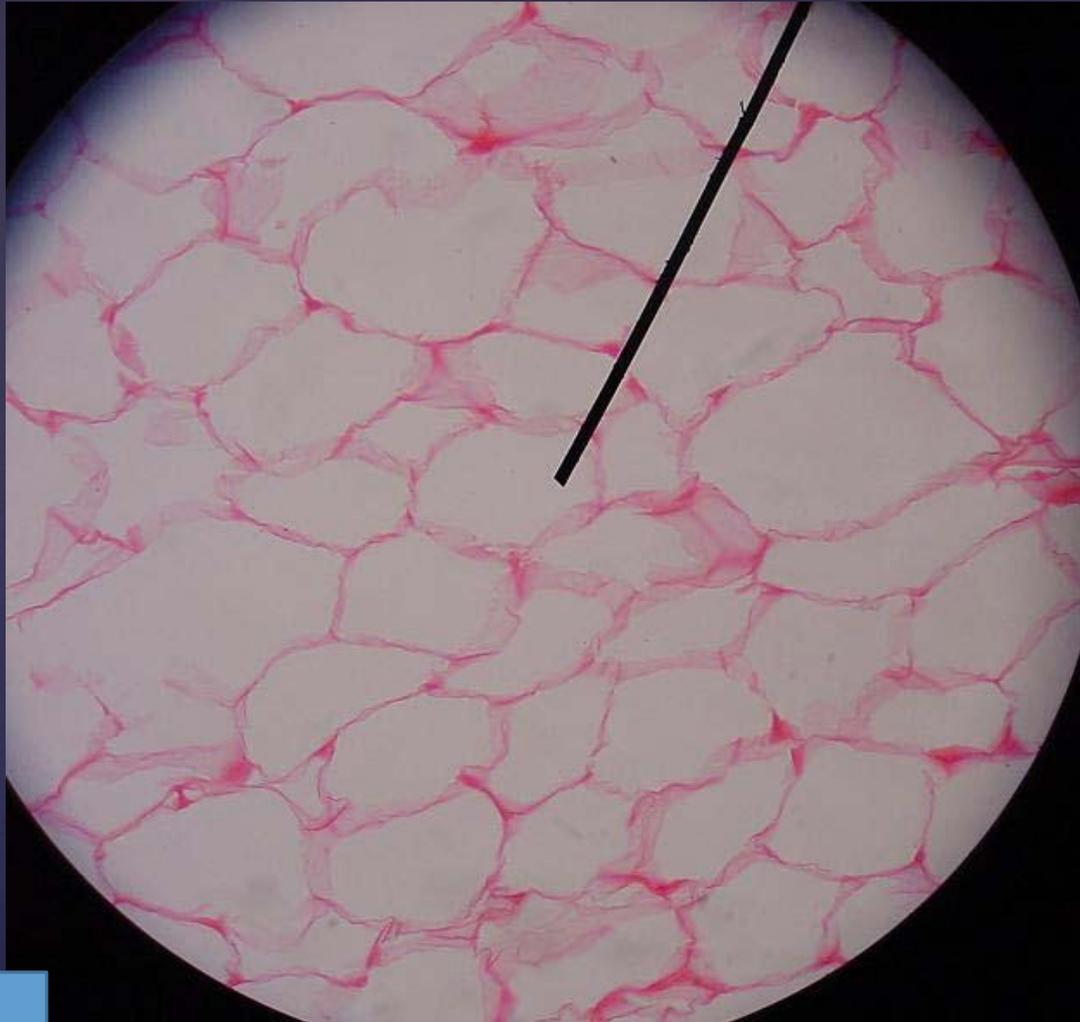
← Back

Loose Connective Tissue - Areolar



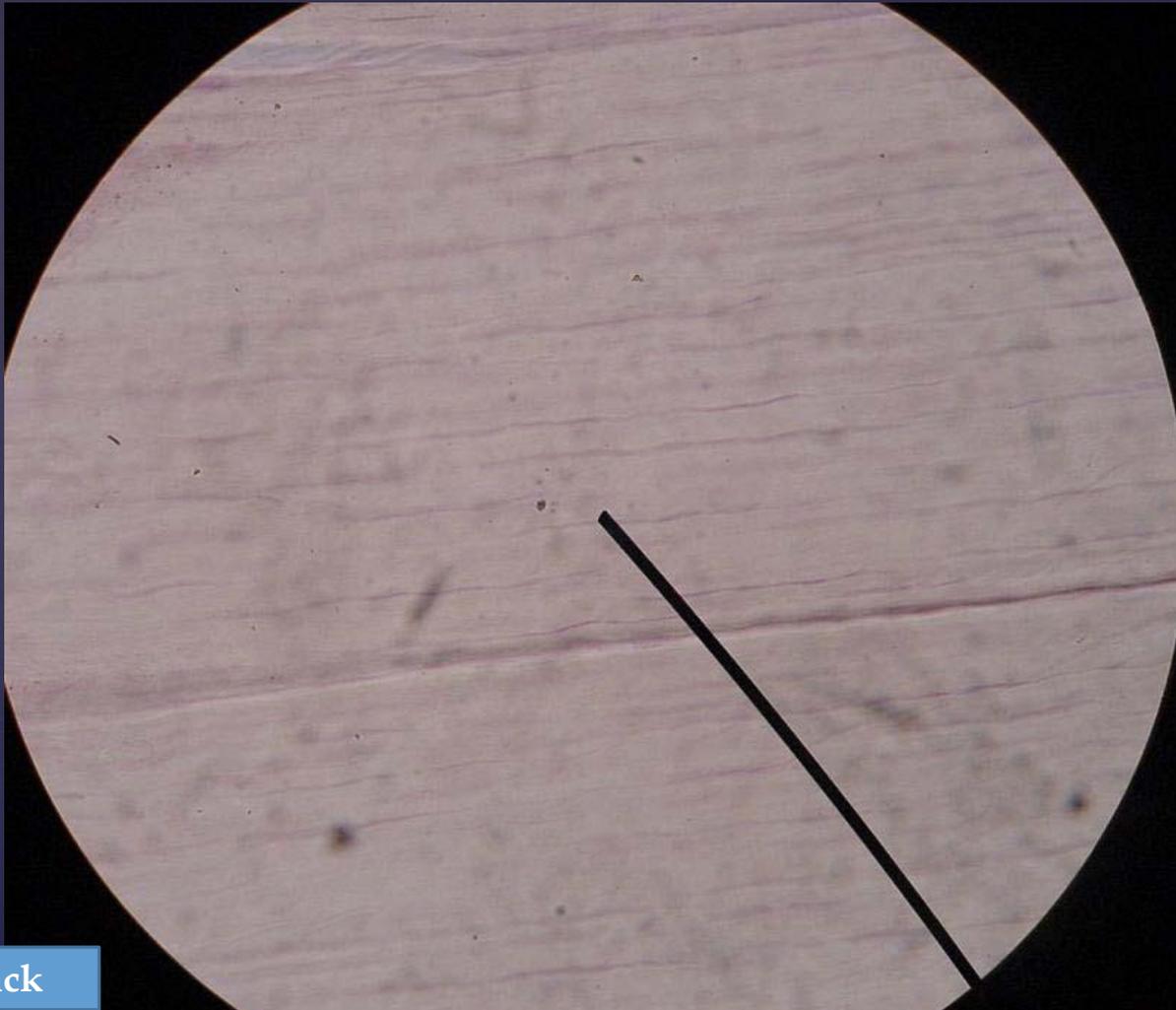
← Back

Loose Connective Tissue - Adipose



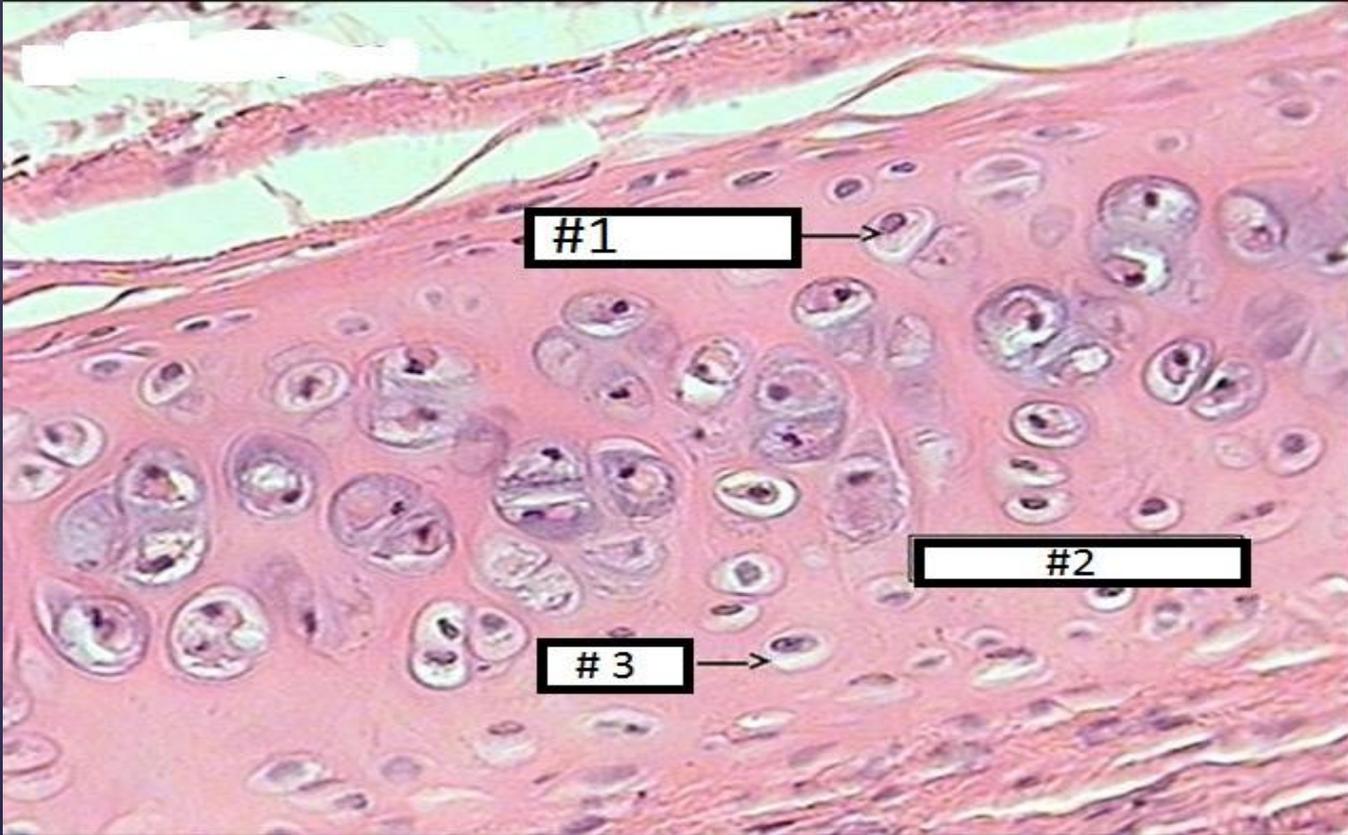
← Back

Loose Connective Tissue - Adipose



← Back

Dense or Fibrous Connective Tissue - Tendon



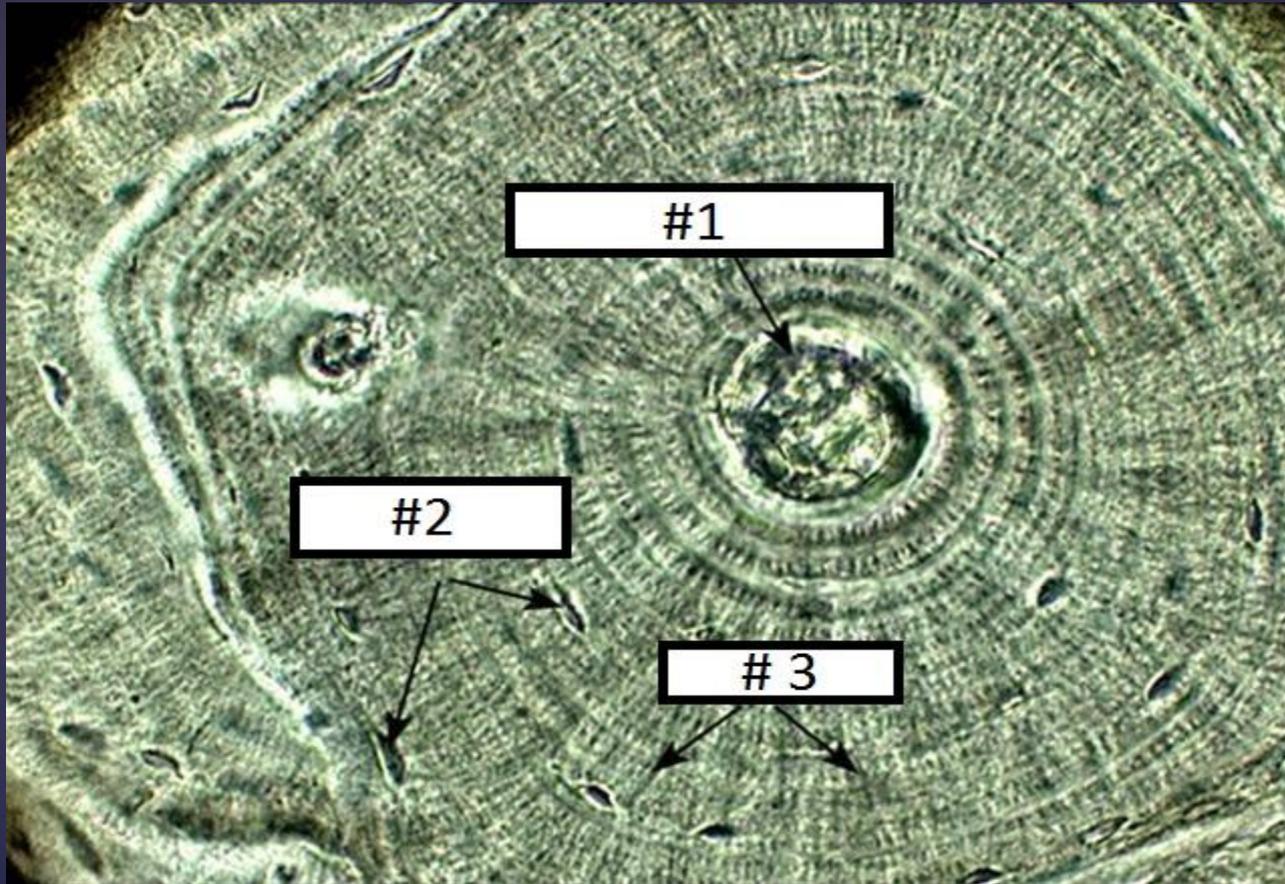
← Back

Cartilage - Hyaline



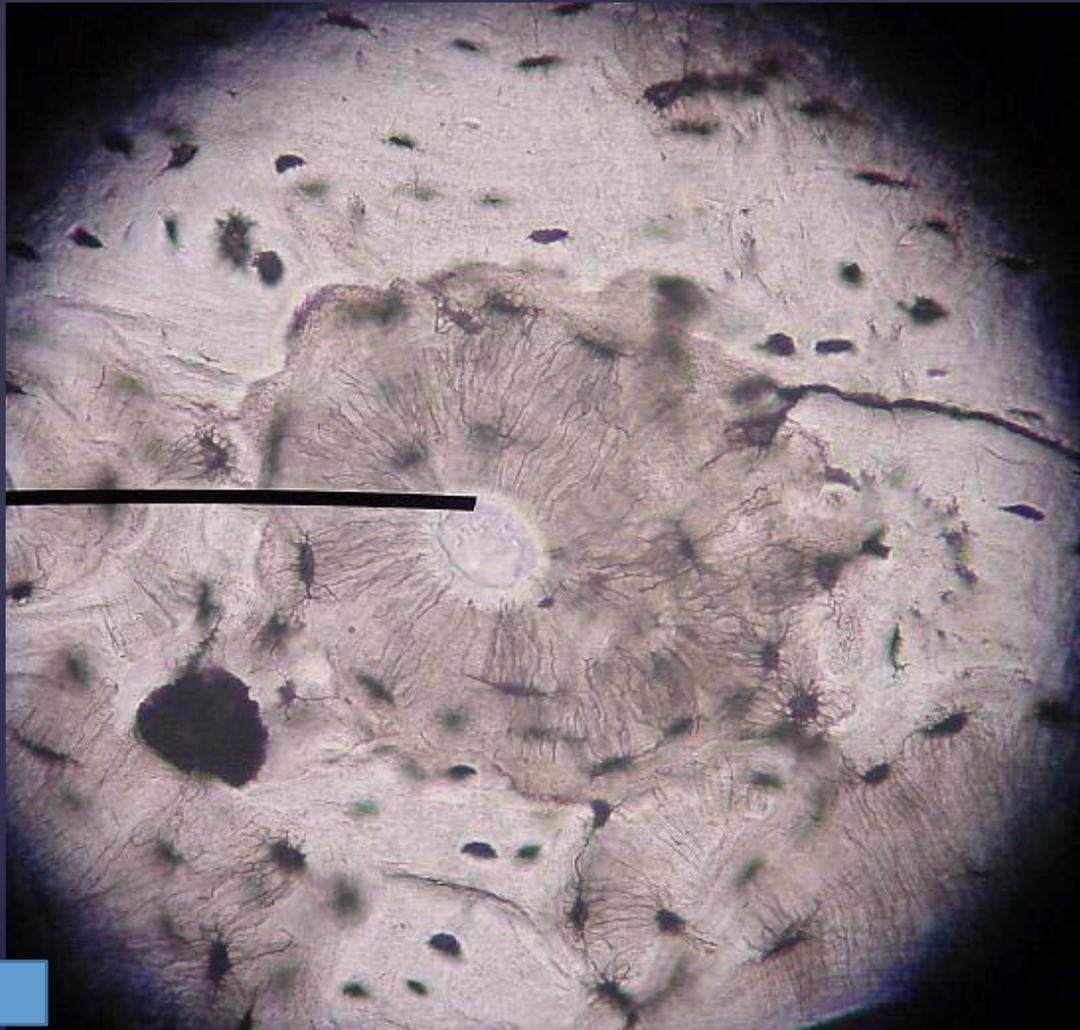
← Back

Cartilage - Hyline



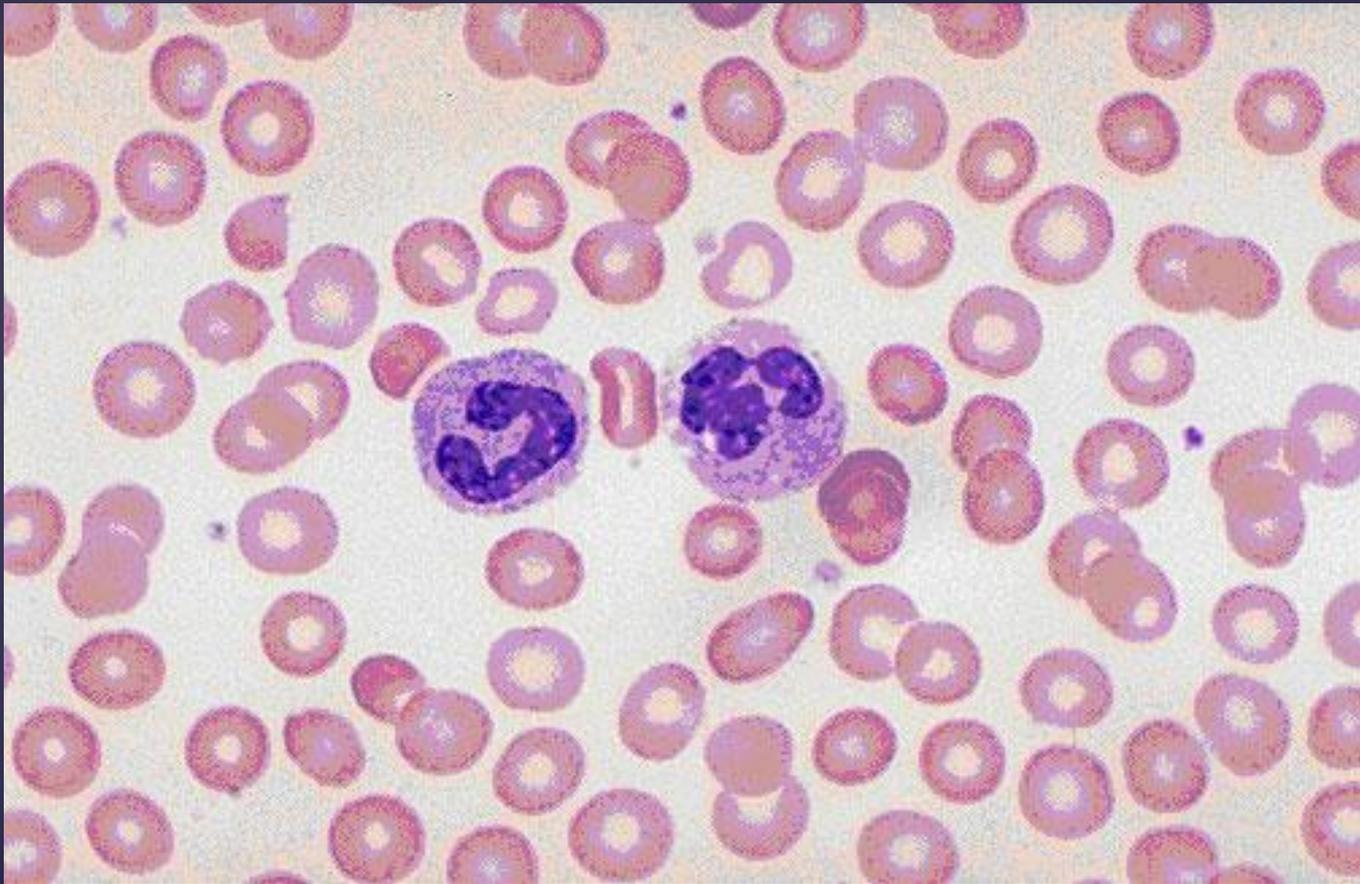
← Back

Compact Bone



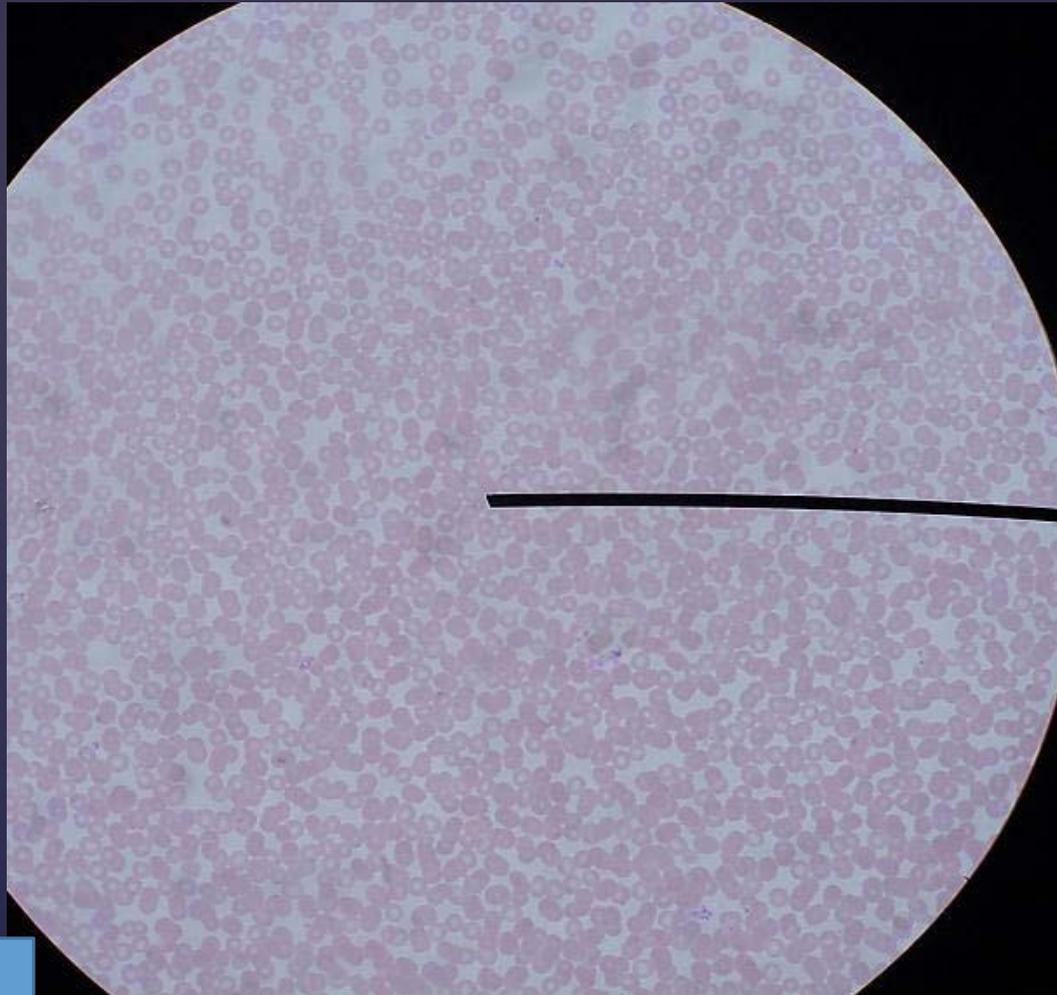
← Back

Compact Bone



← Back

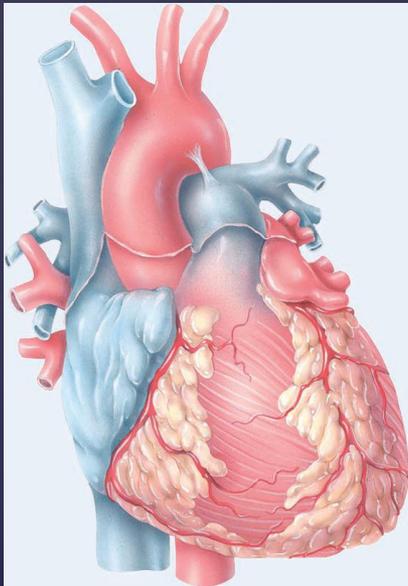
Blood



← Back

Blood

Muscular Tissue



1. Skeletal
2. Cardiac
3. Smooth



First
Slide

Forward

⌘ How to Indentify...

- ⌘ Look for striations (indicates skeletal or cardiac)
- ⌘ Look in intercalated disks (indicating cardiac)



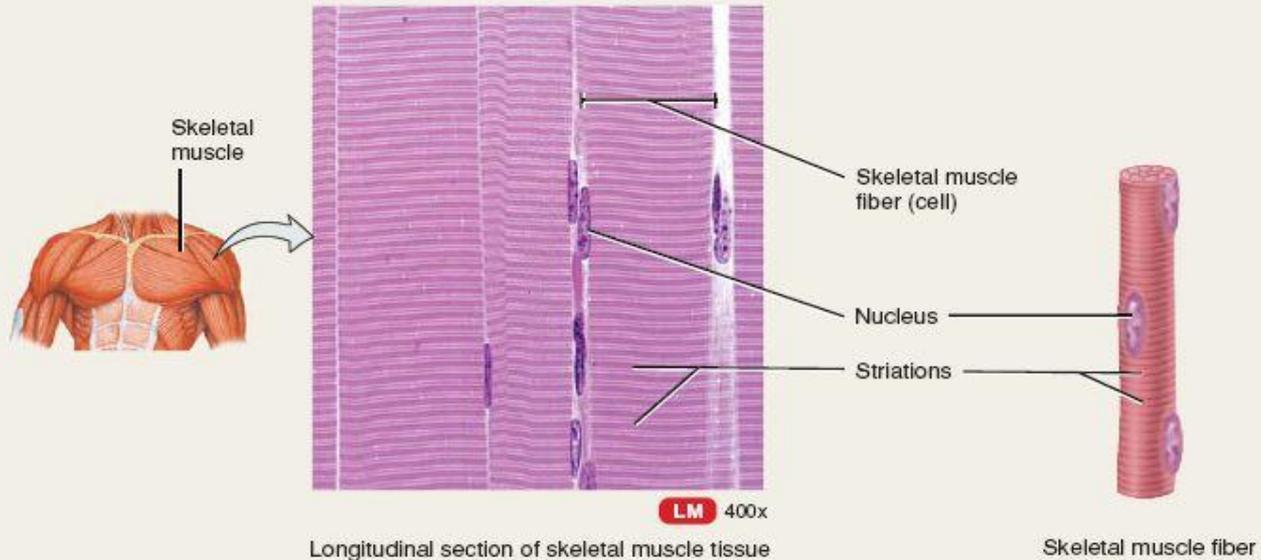
Muscular Tissues

A. Skeletal muscle tissue

Description: Long, cylindrical, striated fibers with many peripherally located nuclei; voluntary control.

Location: Usually attached to bones by tendons.

Function: Motion, posture, heat production, and protection.



Skeletal Muscle

Microscope Example

Back

Other Example

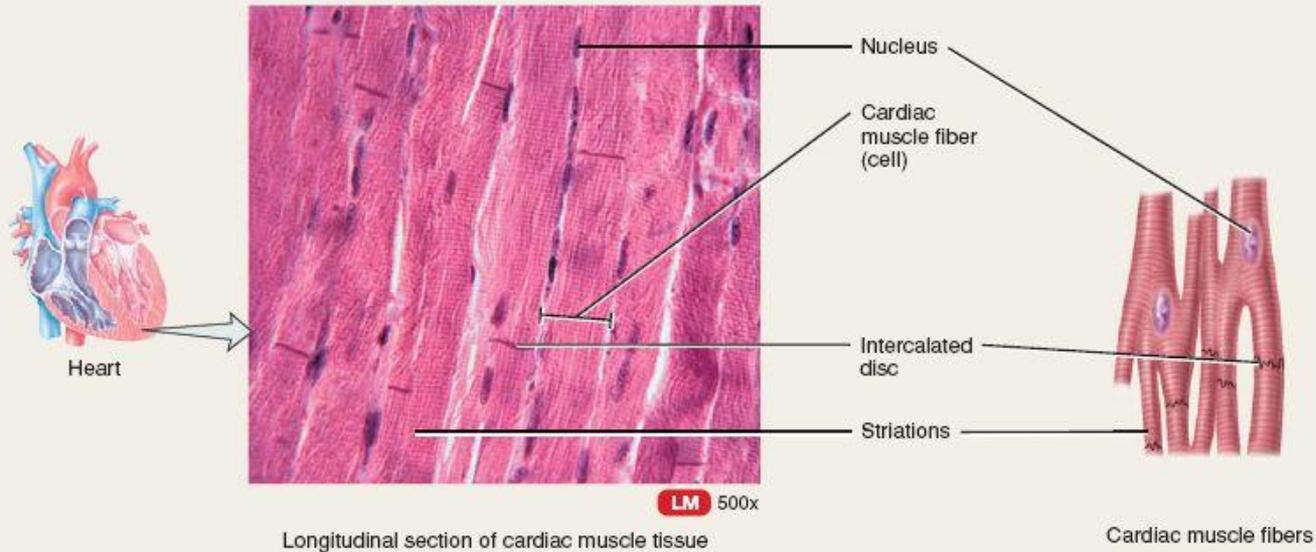
Muscular Tissues

B. Cardiac muscle tissue

Description: Branched striated fibers with one or two centrally located nuclei; contains intercalated discs; involuntary control.

Location: Heart wall.

Function: Pumps blood to all parts of the body.



Cardiac Muscle

Microscope Example

Back

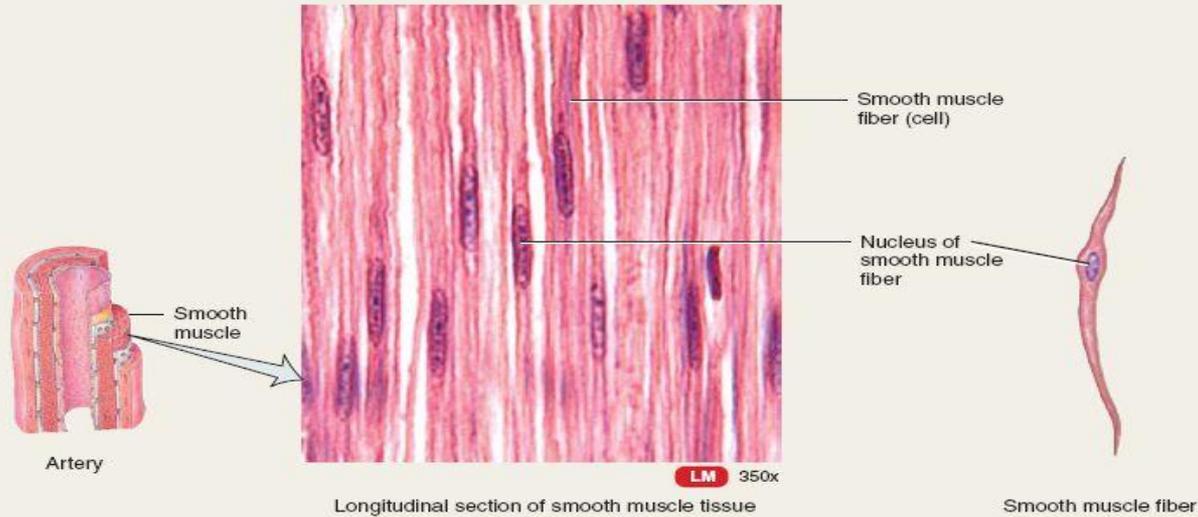
Other Example

C. Smooth muscle tissue

Description: Spindle-shaped (thickest in middle and tapering at both ends), nonstriated fibers with one centrally located nucleus; involuntary control.

Location: Iris of the eyes, walls of hollow internal structures such as blood vessels, airways to the lungs, stomach, intestine, gallbladder, urinary bladder, and uterus.

Function: Motion (constriction of blood vessels and airways, propulsion of foods through gastrointestinal tract, contraction of urinary bladder and gallbladder).

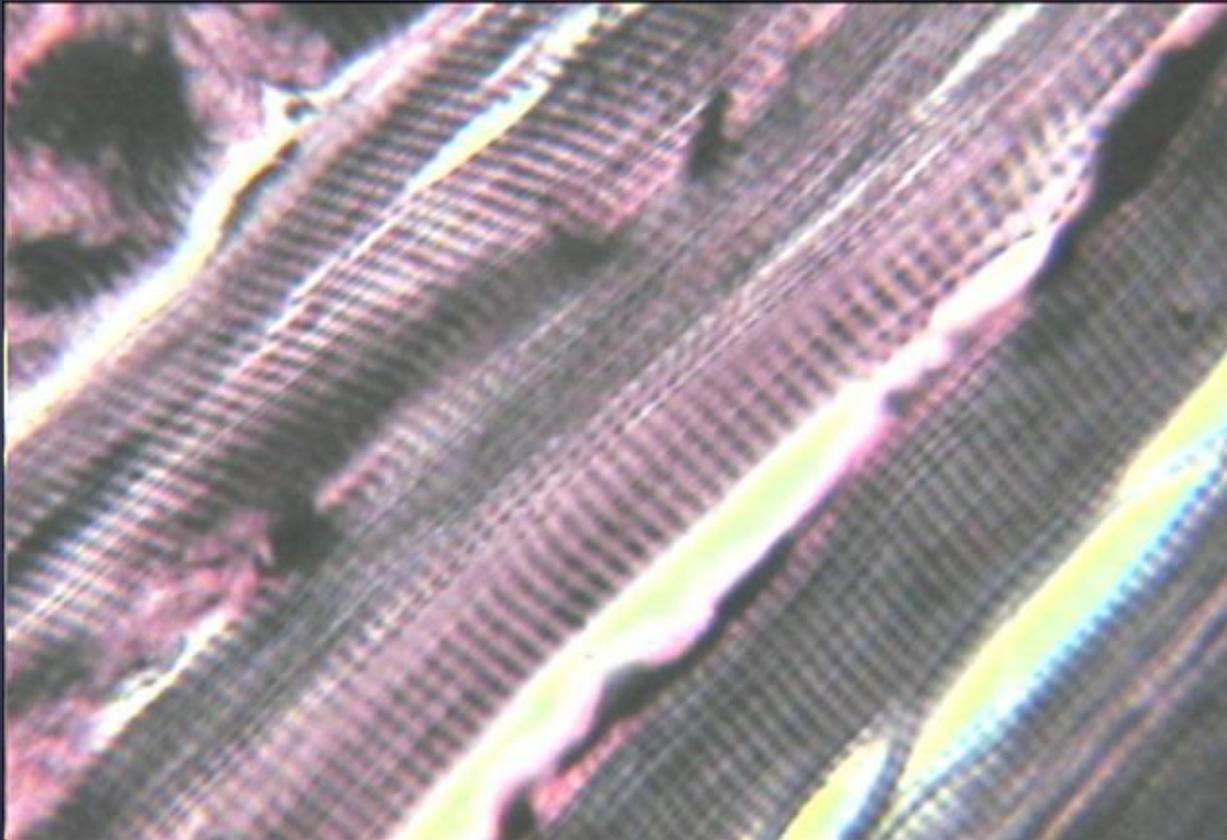


Smooth Muscle

Microscope Example

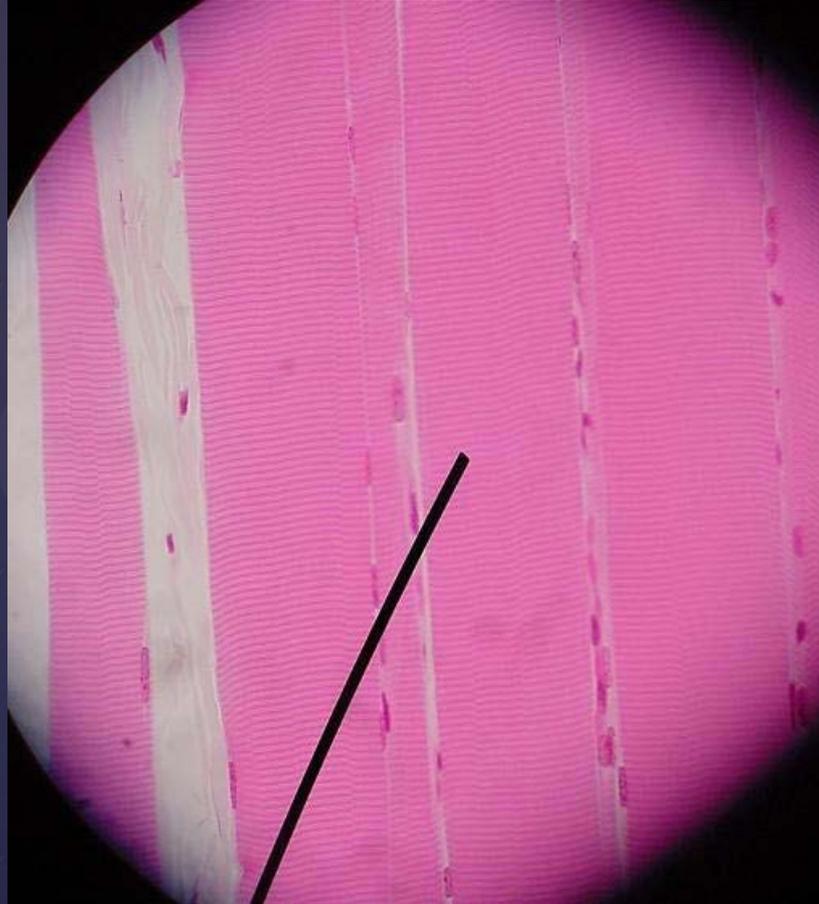
Back

Other Example



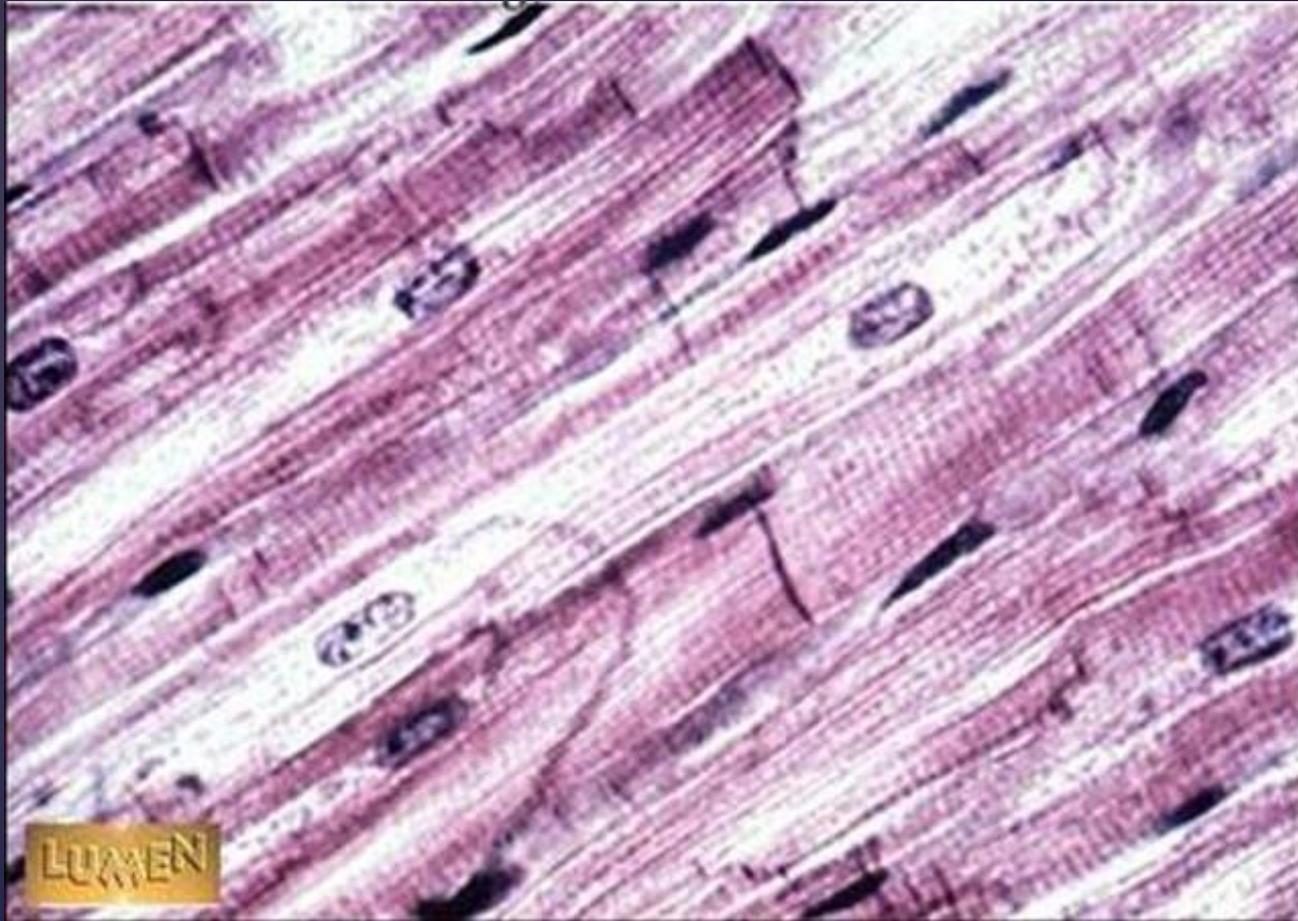
← Back

Skeletal Muscle



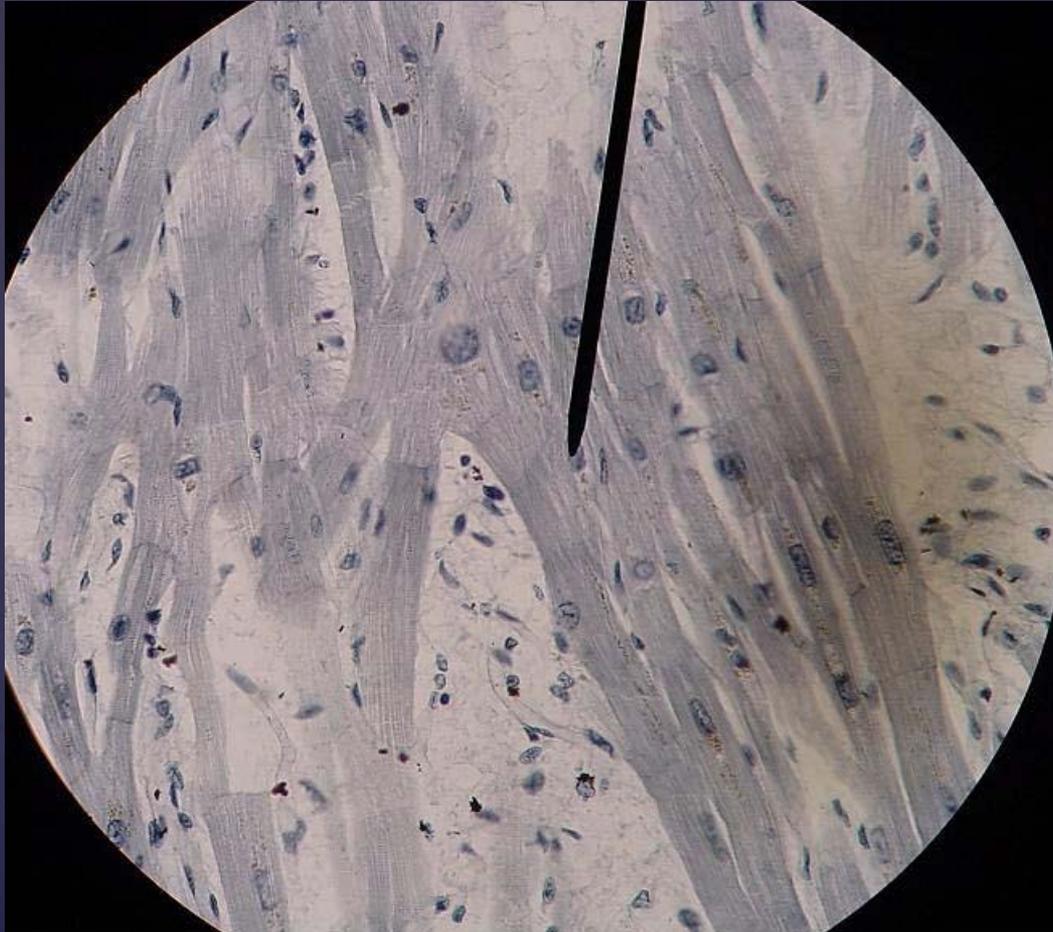
← Back

Skeletal Muscle



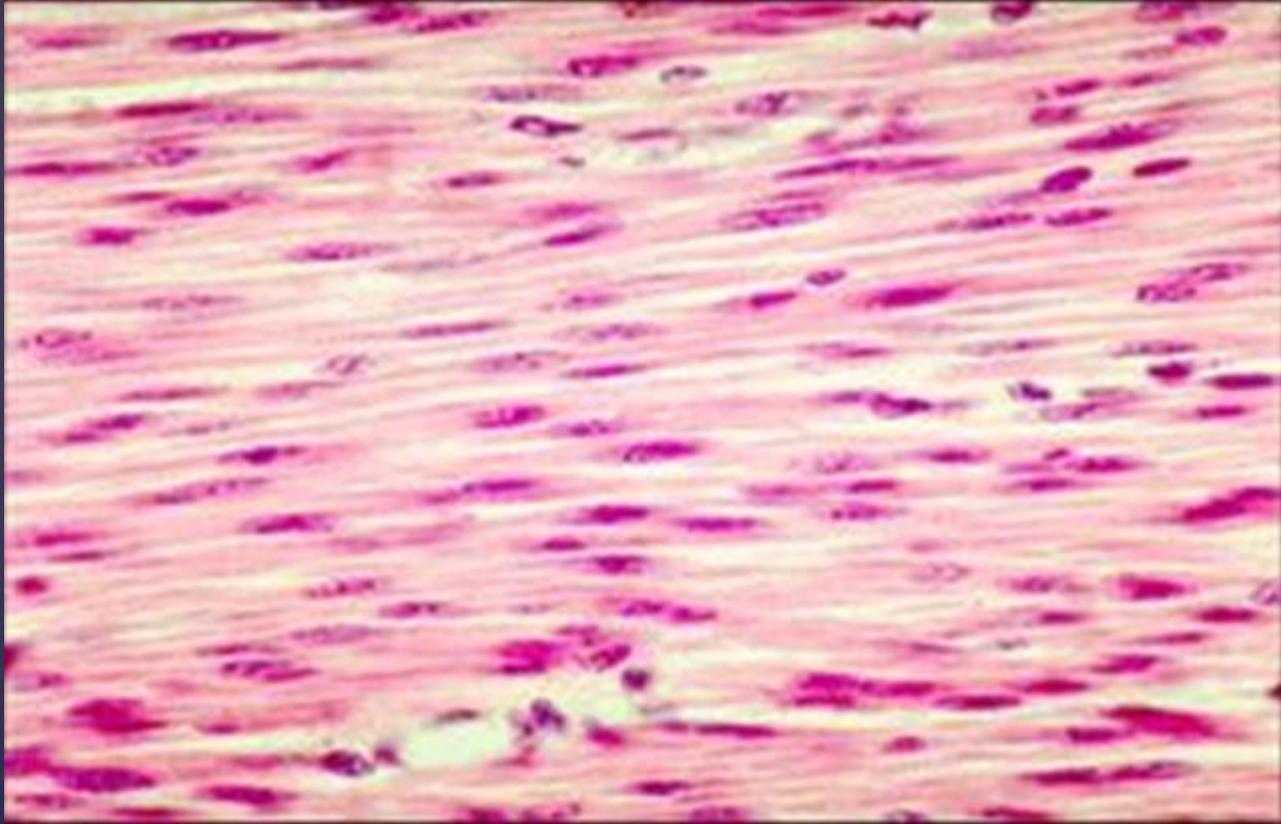
Back

Cardiac Muscle



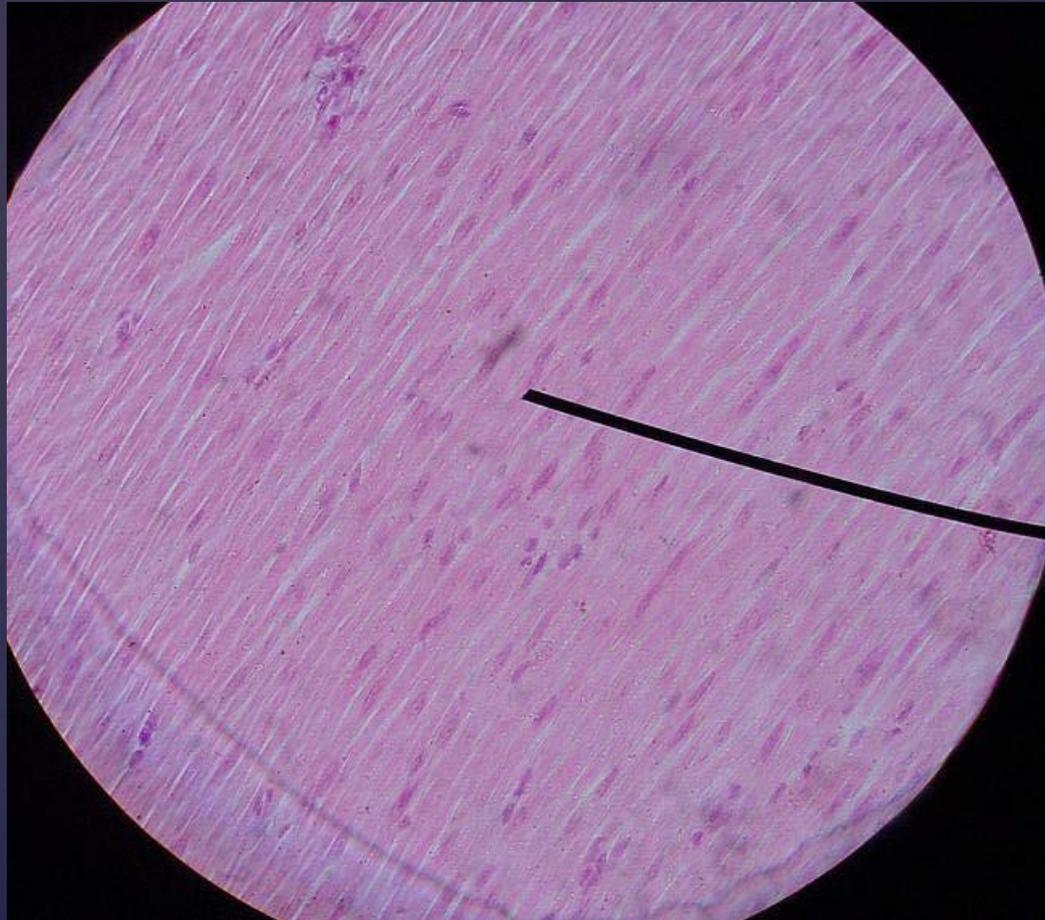
← Back

Cardiac Muscle



← Back

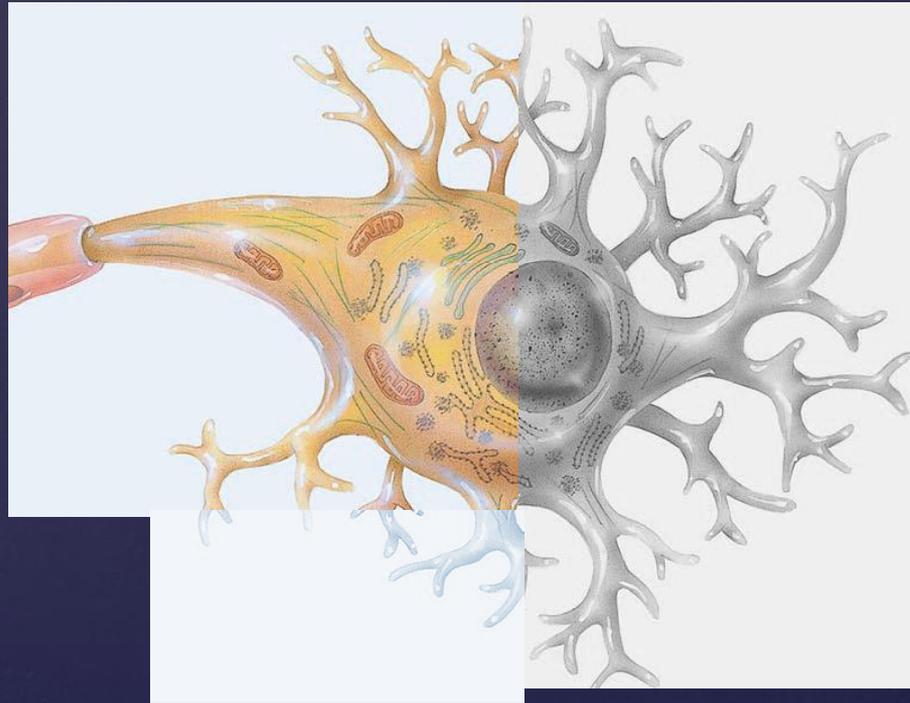
Smooth Muscle



← Back

Smooth Muscle

Nervous Tissue



First
Slide

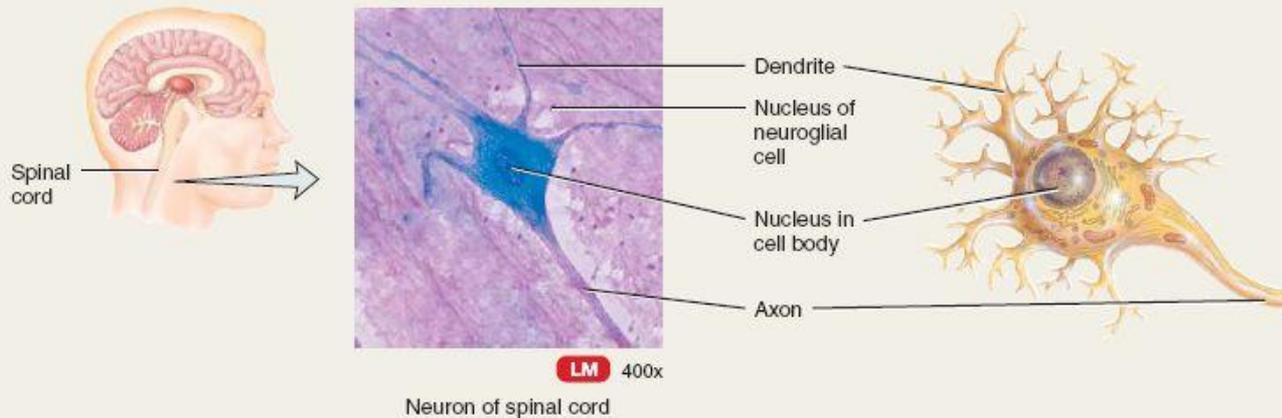
Forward

Nervous Tissue

Description: Consists of neurons (nerve cells) and neuroglia. Neurons consist of a cell body and processes extending from the cell body (multiple dendrites and a single axon). Neuroglia do not generate or conduct nerve impulses but have other important supporting functions.

Location: Nervous system.

Function: Exhibits sensitivity to various types of stimuli, converts stimuli into nerve impulses (action potentials), and conducts nerve impulses to other neurons, muscle fibers, or glands.

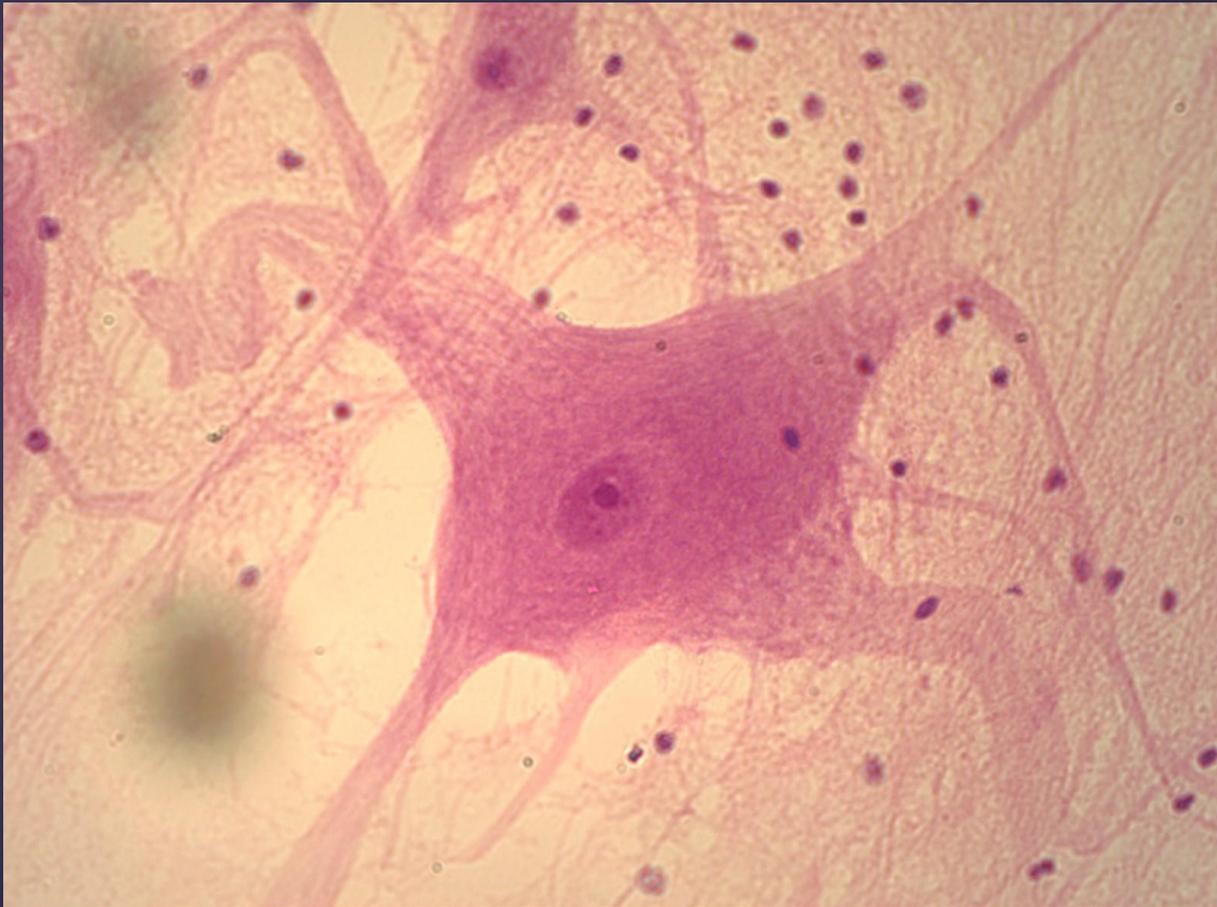


Nervous Tissue

Microscope Example

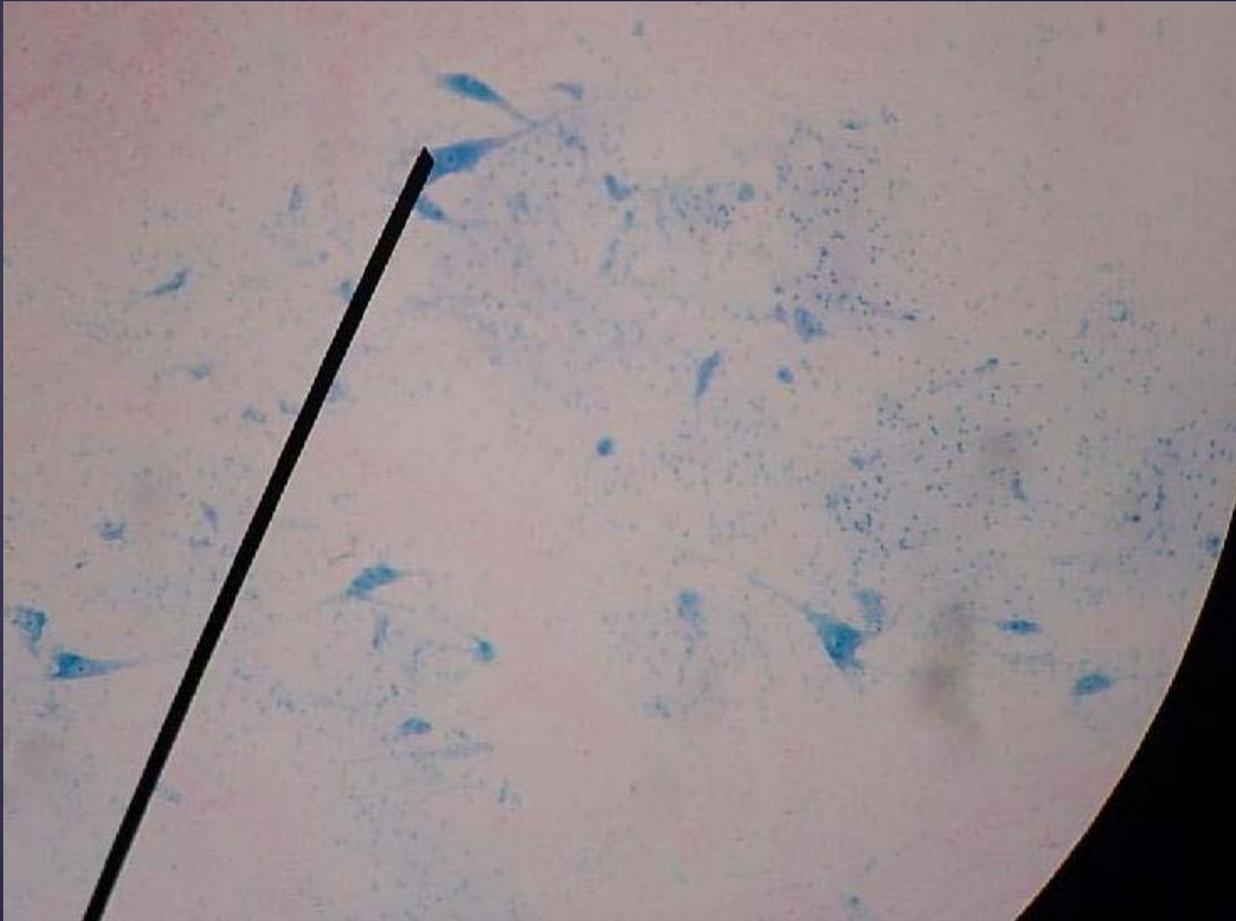
Back

Other Example



← Back

Nervous Tissue



← Back

Nervous Tissue



DAYTONA STATE COLLEGE

Questions



Prepared by

Eddie Hoppe (SI Leader)

The Academic Support Center @ Daytona State College

<http://www.daytonastate.edu/asc/ascsiencehandouts.html>