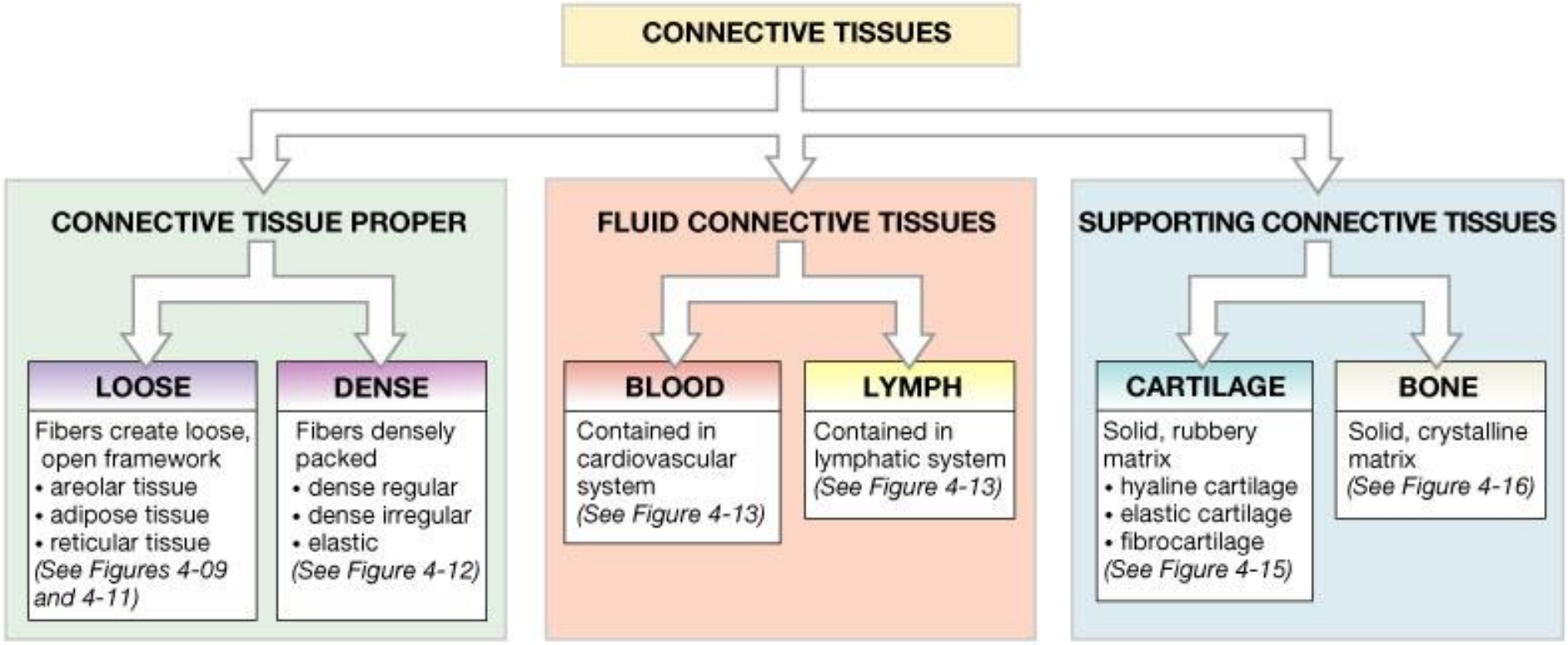
CLASSIFICATION OF TISSUES: CONNECTIVE TISSUE

Connective Tissue: a tissue that supports, transports, binds, and protects structures in the body

Types of Connective Tissue



I will use BOTH microscopes AND histograms to test you on epithelial tissues.

Make sure you look at the microscopes in lab and the histograms in this presentation.

Make sure you know all the pieces of information listed in your lab packets!

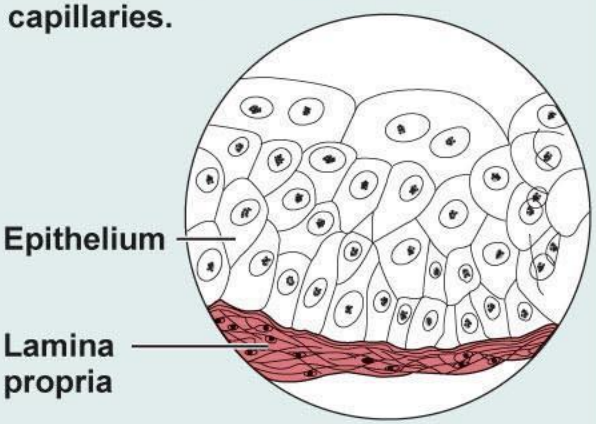
Also know the locations of ALL tissues!

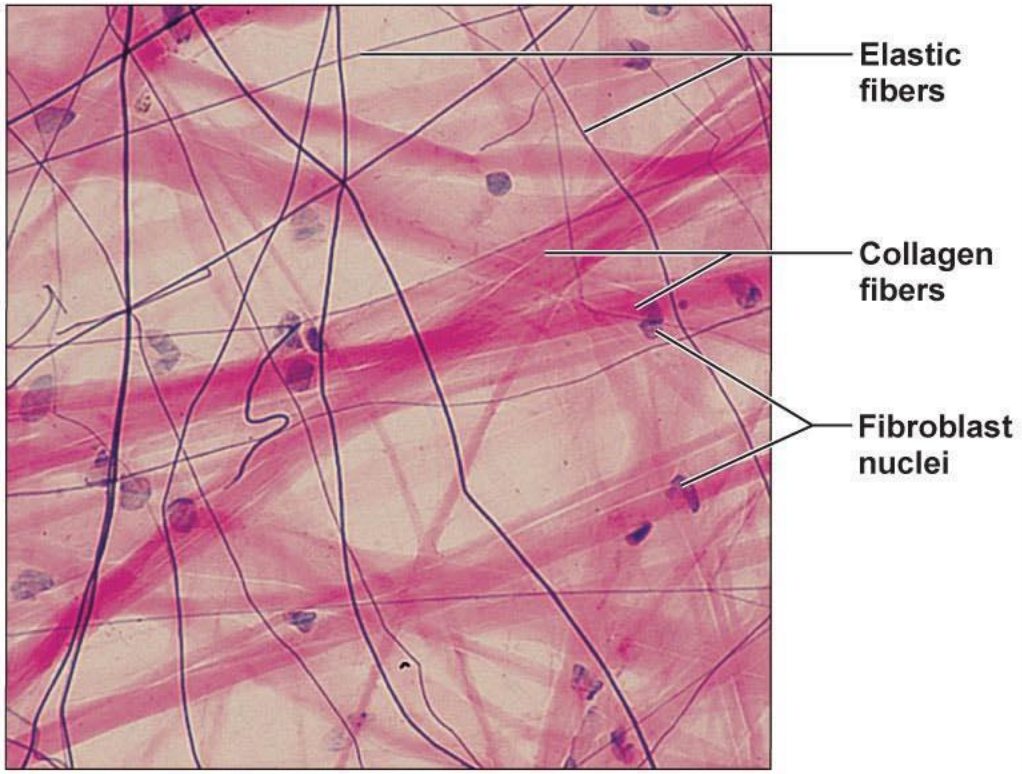
(a) Connective tissue proper: loose connective tissue, areolar

Description: Gel-like matrix with all three fiber types; cells: fibroblasts, macrophages, mast cells, and some white blood cells.

Function: Wraps and cushions organs; its macrophages phagocytize bacteria; plays important role in inflammation; holds and conveys tissue fluid.

Location: Widely distributed under epithelia of body, e.g., forms lamina propria of mucous membranes; packages organs; surrounds capillaries.

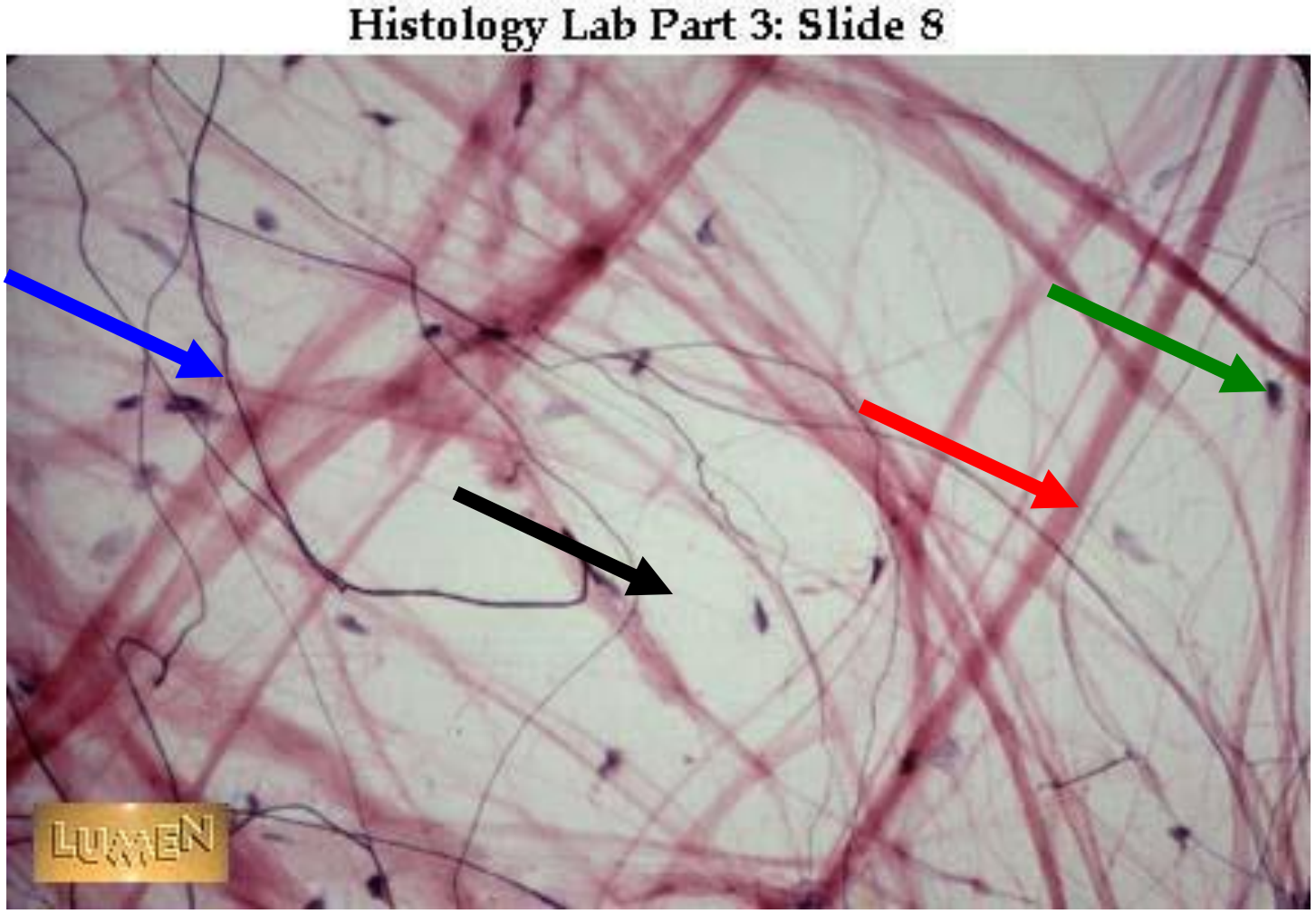




Photomicrograph: Areolar connective tissue, a soft packaging tissue of the body (300x).

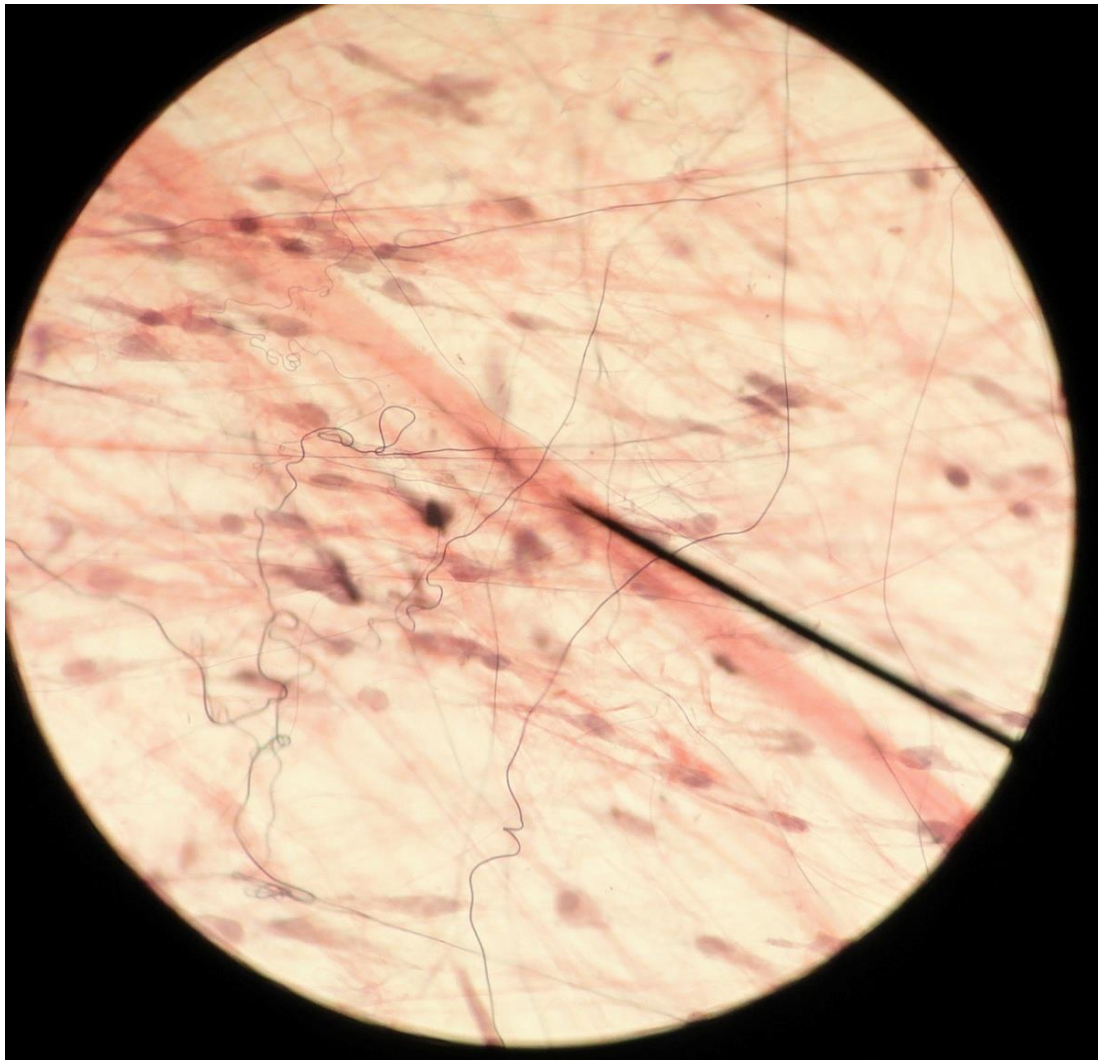
Loose Connective Tissue: **Areolar Tissue**

Find: matrix/ground substance, collagen fibers, elastic fibers, nuclei of cells

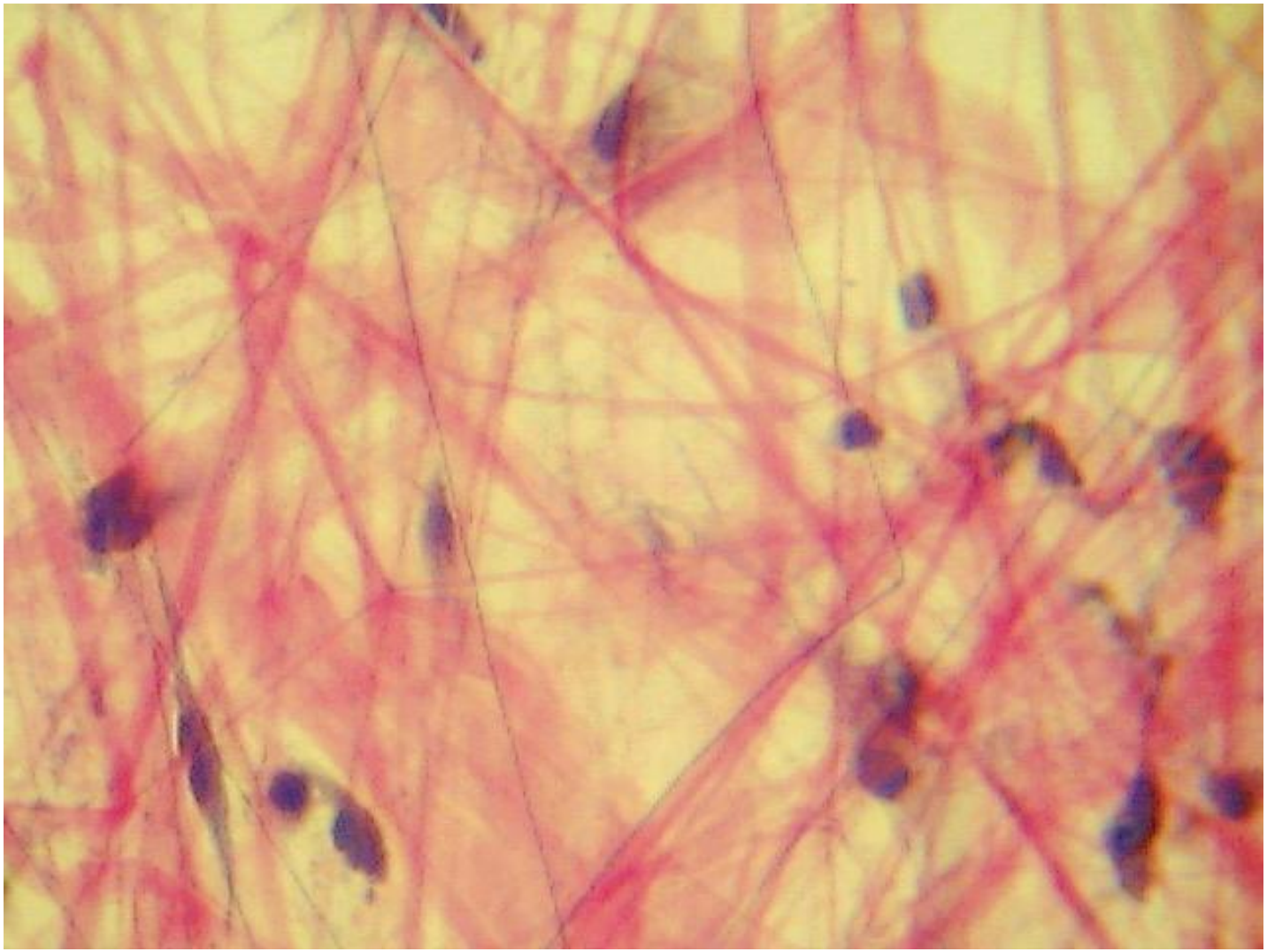


Loose Connective Tissue - Areolar

note the collagen fiber at the pointer and the black elastic fibers. Also note the nuclei of cells.



Areolar Tissue



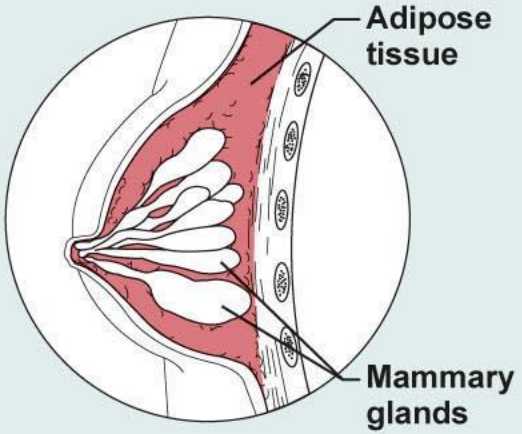
Loose Connective Tissue: **Adipose Tissue**

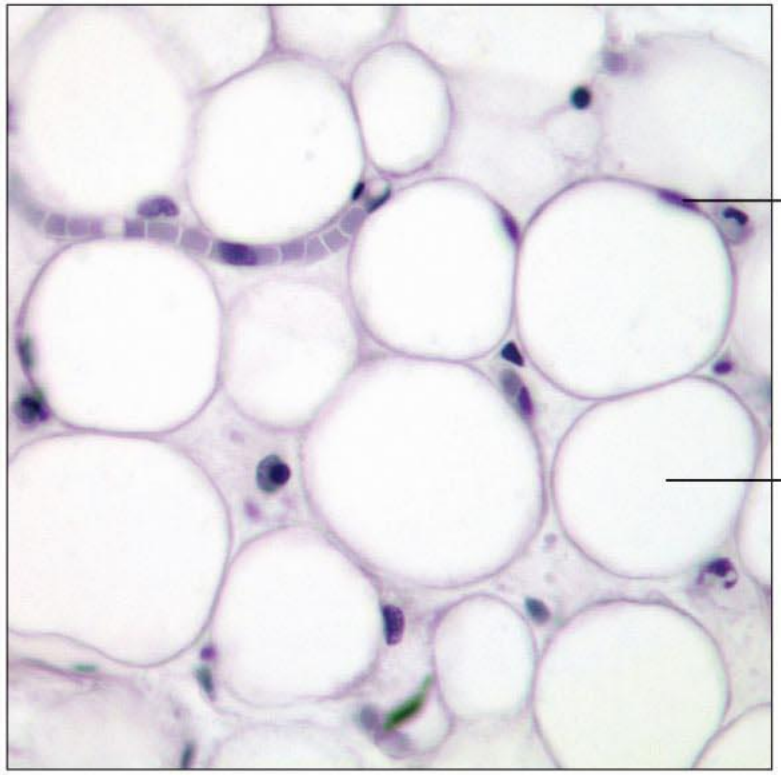
(b) Connective tissue proper: loose connective tissue, adipose

Description: Matrix as in areolar, but very sparse; closely packed adipocytes, or fat cells, have nucleus pushed to the side by large fat droplet.

Function: Provides reserve food fuel; insulates against heat loss; supports and protects organs.

Location: Under skin in the hypodermis; around kidneys and eyeballs; within abdomen; in breasts.

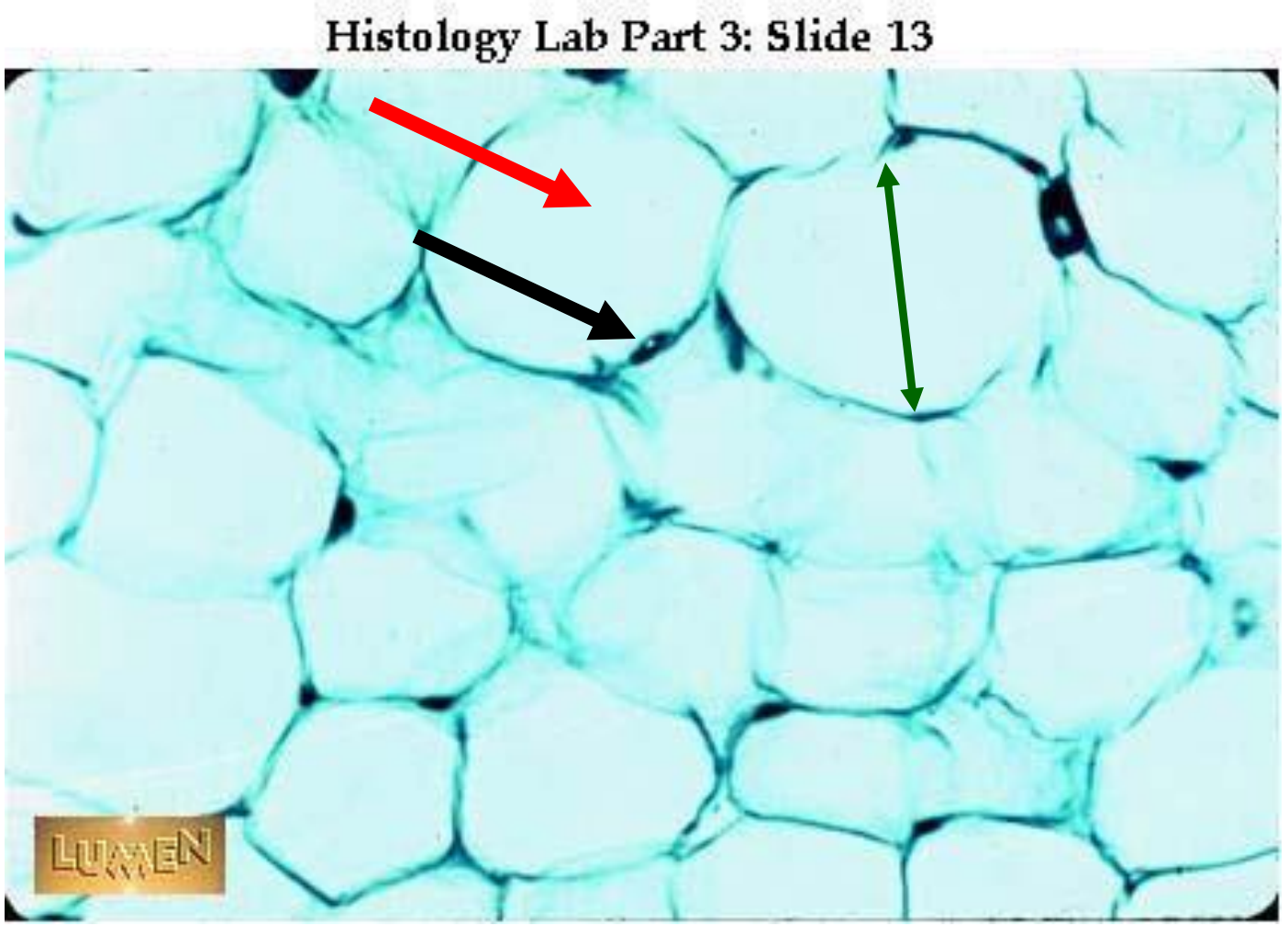




Photomicrograph: Adipose tissue from the subcutaneous layer under the skin (350x).

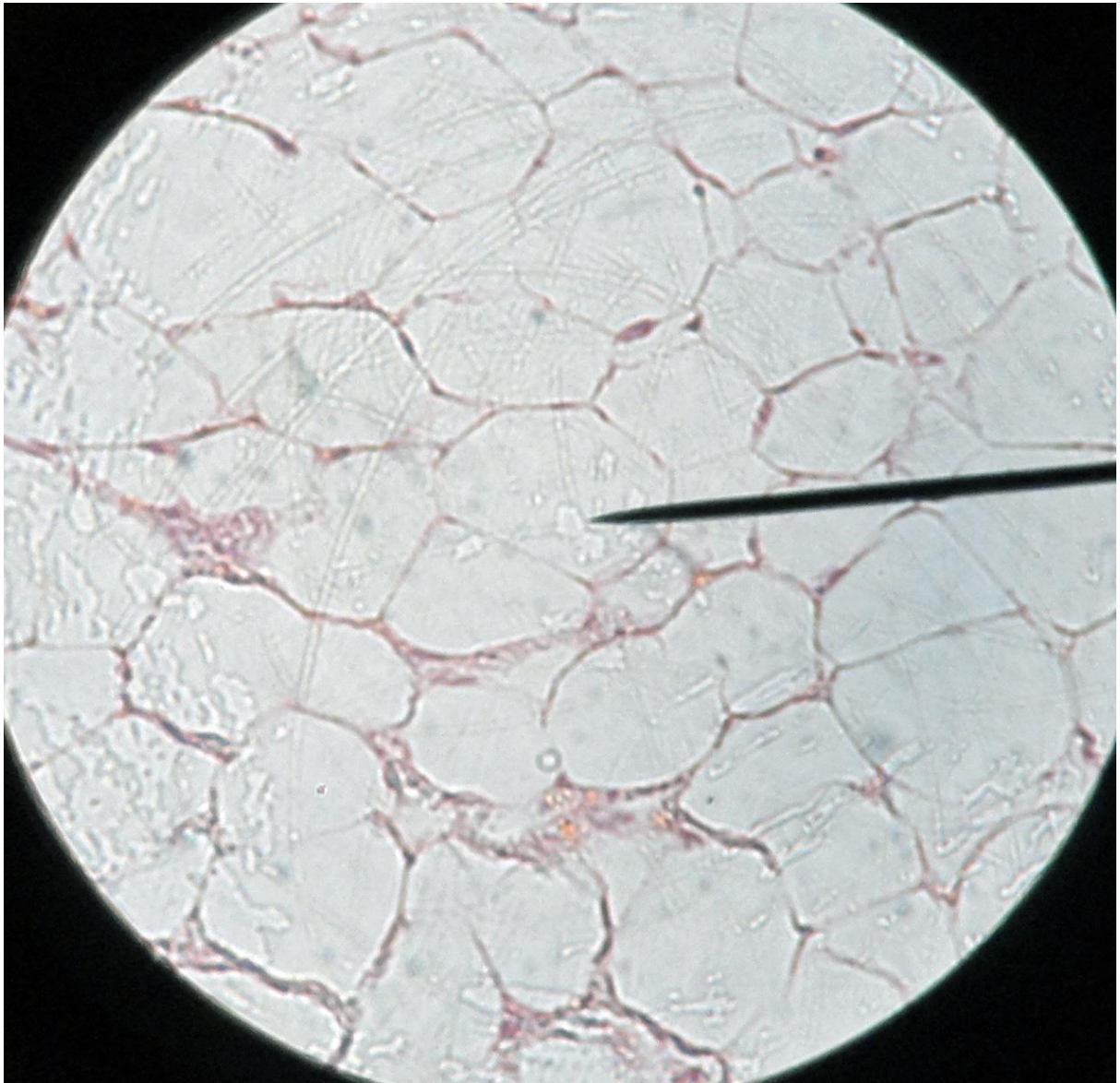
Loose Connective Tissue: **Adipose Tissue**

Find: adipocyte, lipid droplet, nucleus of an adipocyte

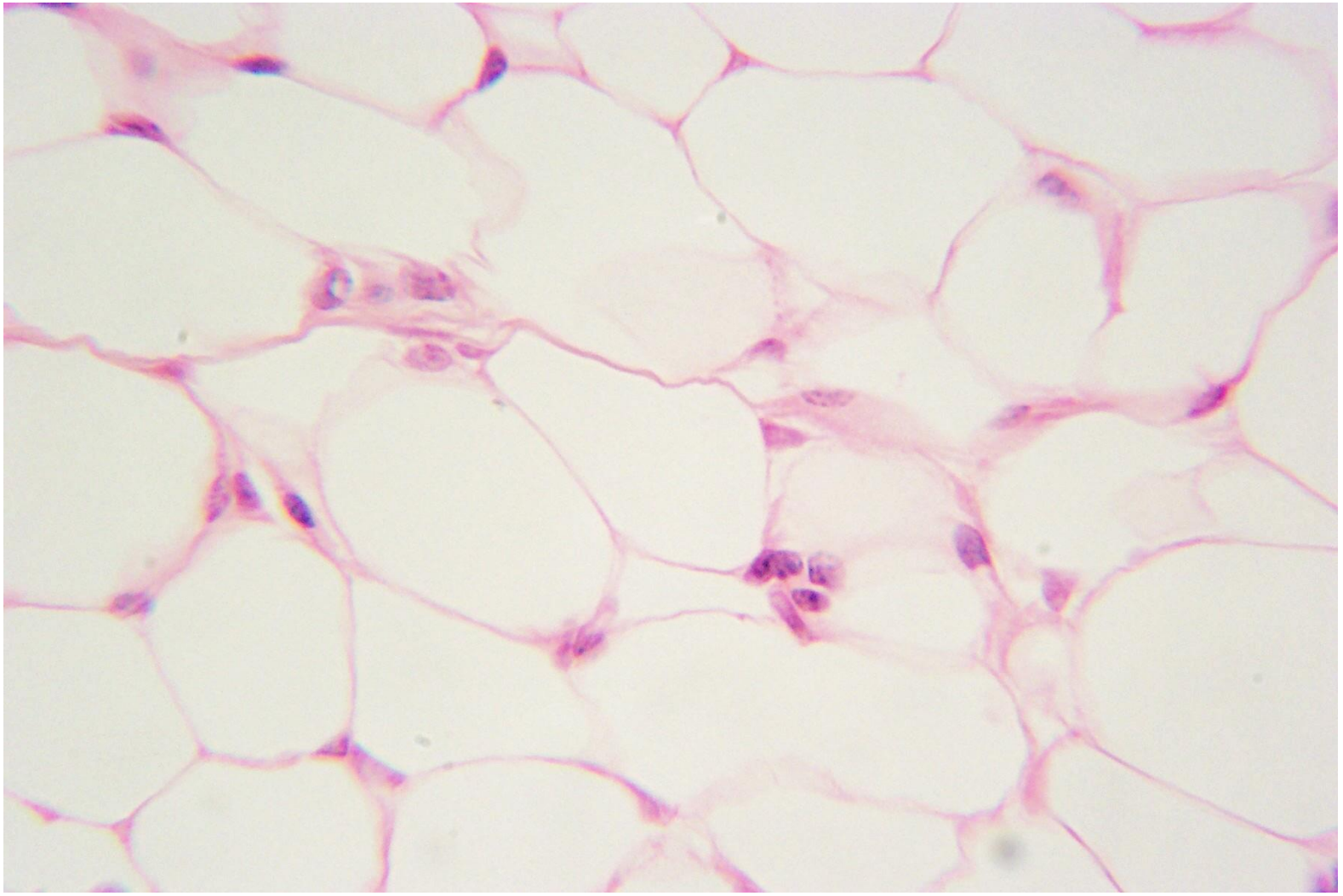


Loose Connective Tissue – Adipose

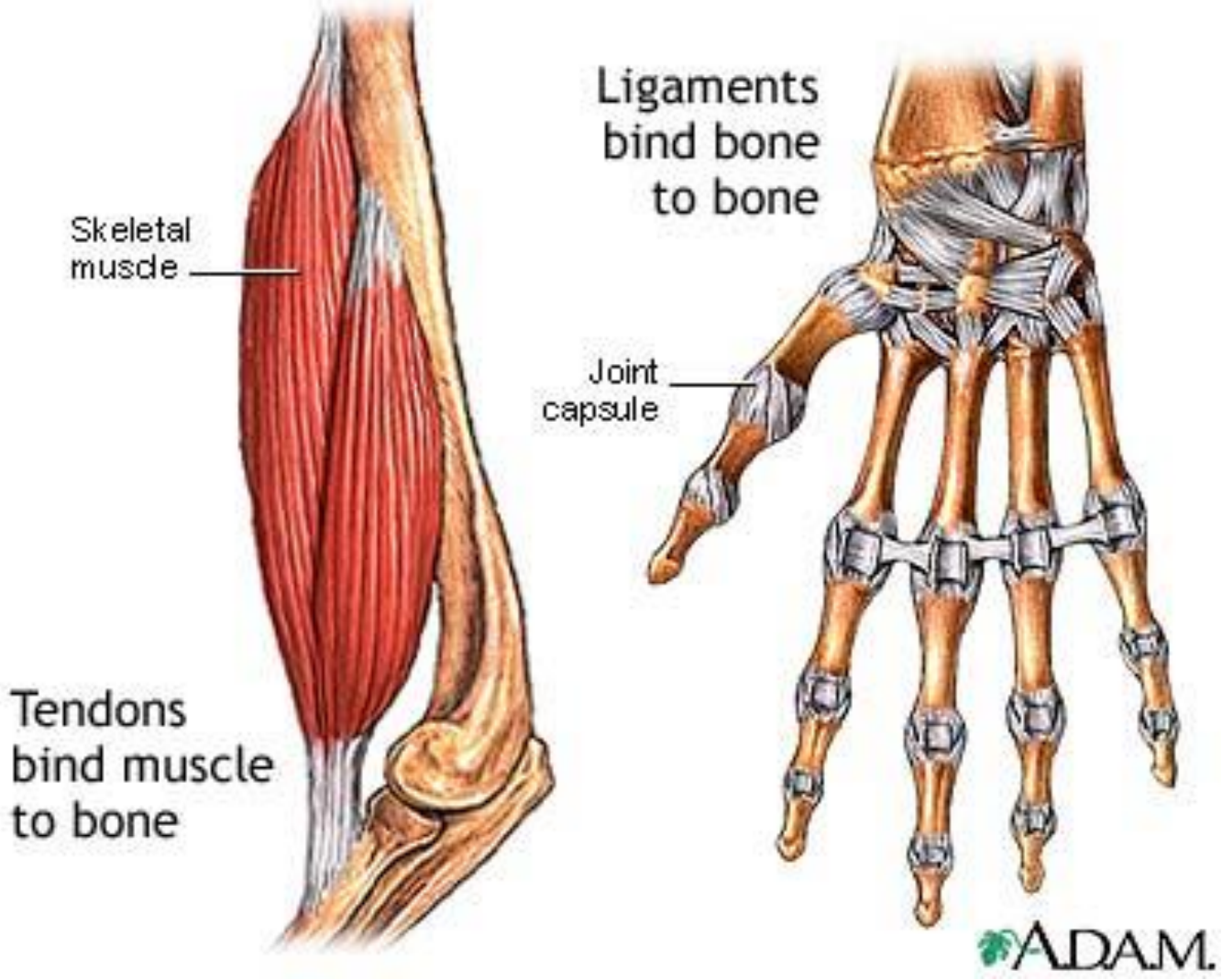
Note: Adipocytes, Lipid Droplets, Nuclei of Adipocytes



Adipose Tissue



Dense Regular Connective Tissue **Ligaments & Tendons –**

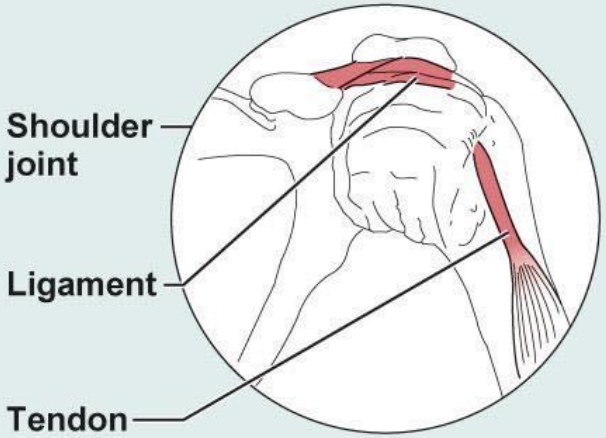


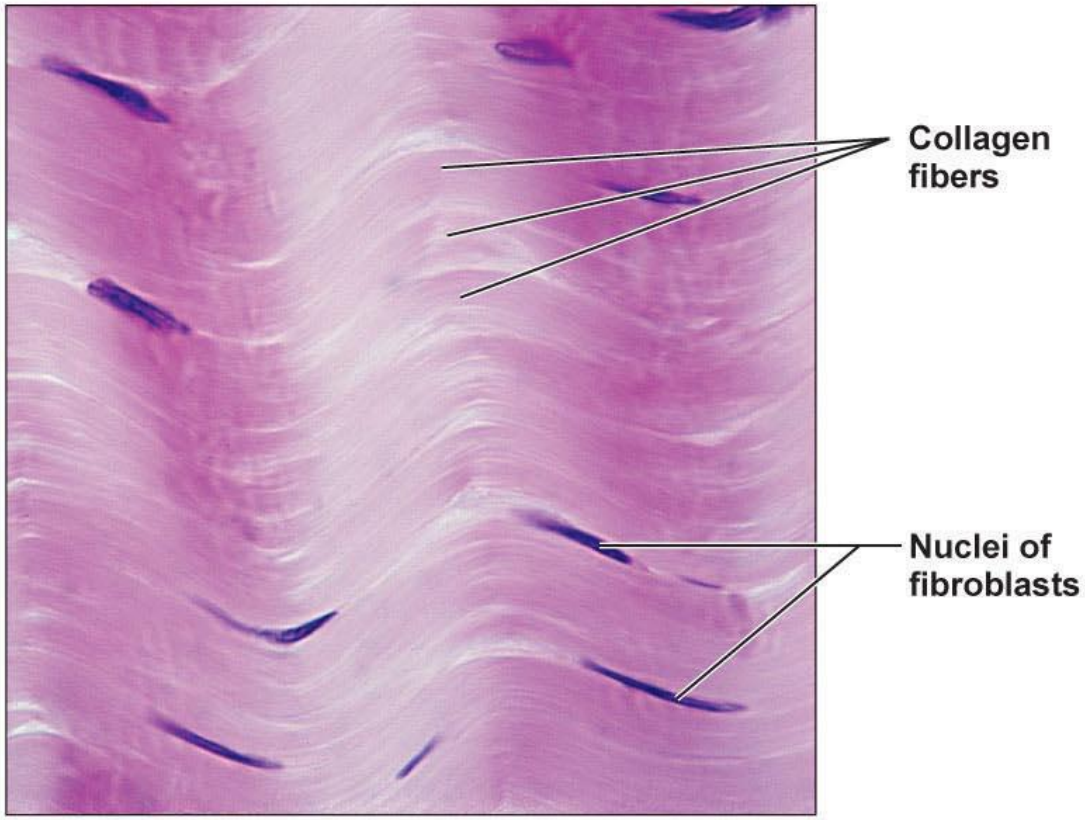
(d) Connective tissue proper: dense connective tissue, dense regular

Description: Primarily parallel collagen fibers; a few elastic fibers; major cell type is the fibroblast.

Function: Attaches muscles to bones or to muscles; attaches bones to bones; withstands great tensile stress when pulling force is applied in one direction.

Location: Tendons, most ligaments, aponeuroses.

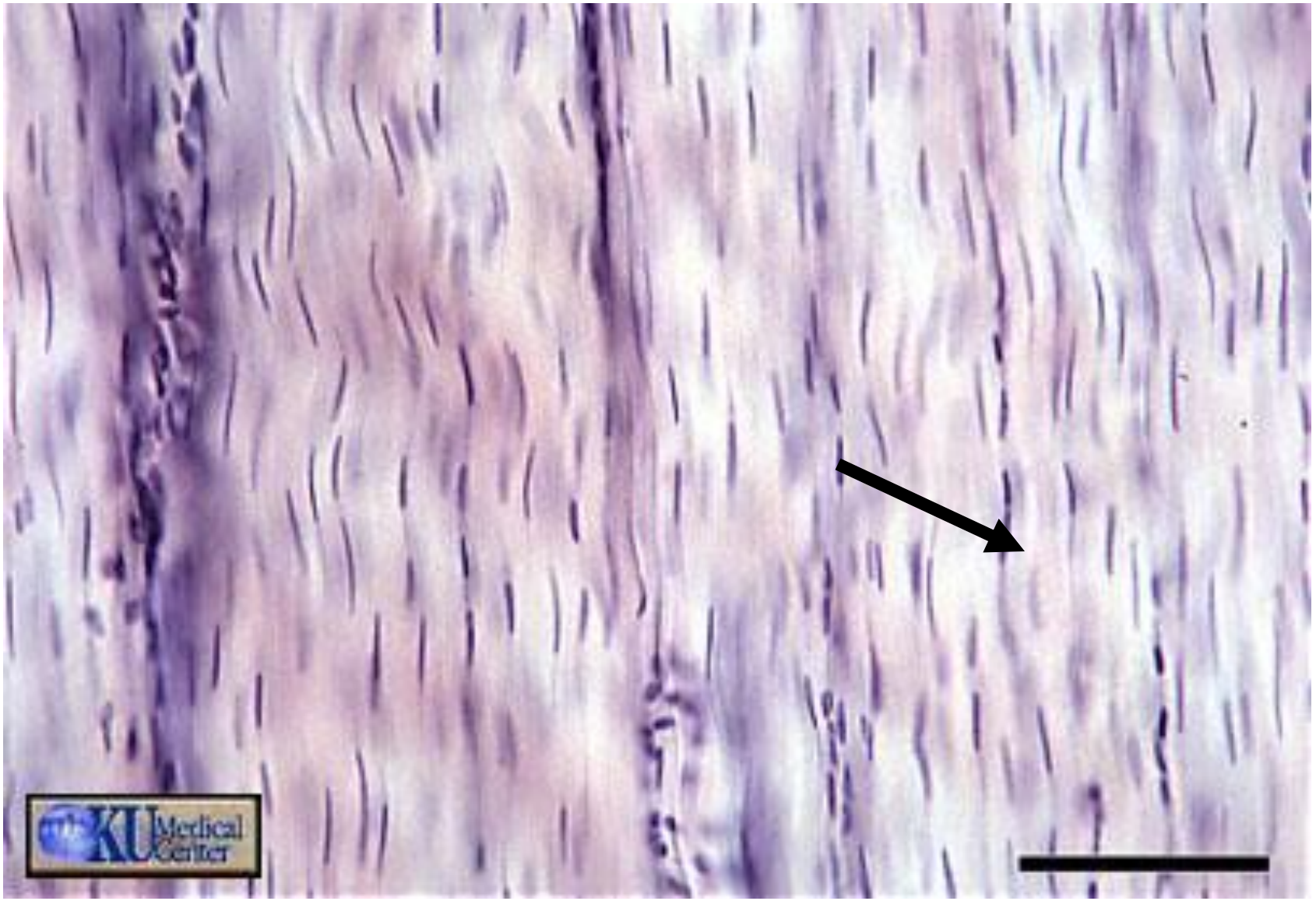




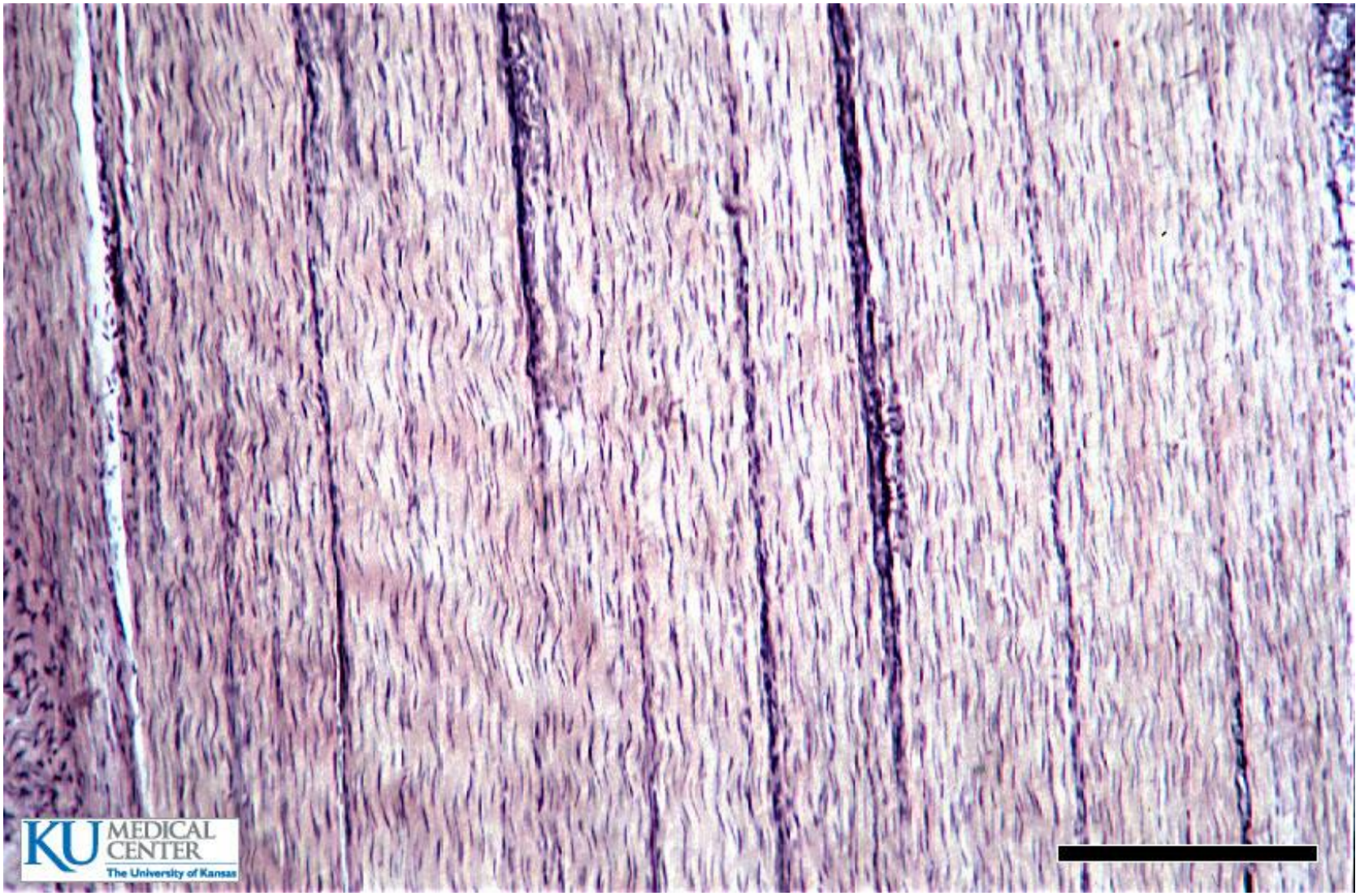
Photomicrograph: Dense regular connective tissue from a tendon (500x).

Dense Regular Connective Tissue

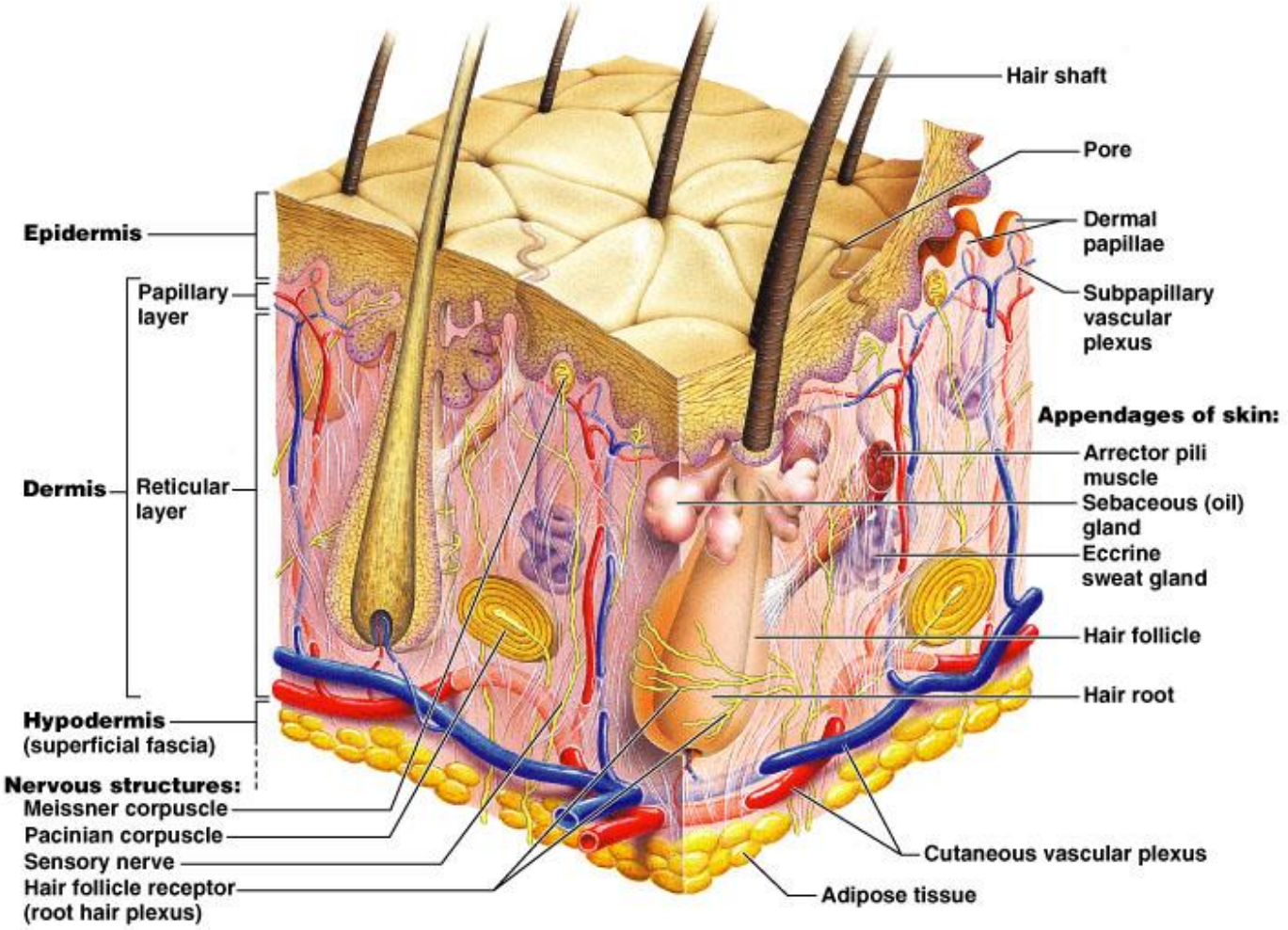
Find: collagen fibers, nuclei of fibroblasts



Dense Regular Connective Tissue



Dense Irregular Connective Tissue
Skin Dermis

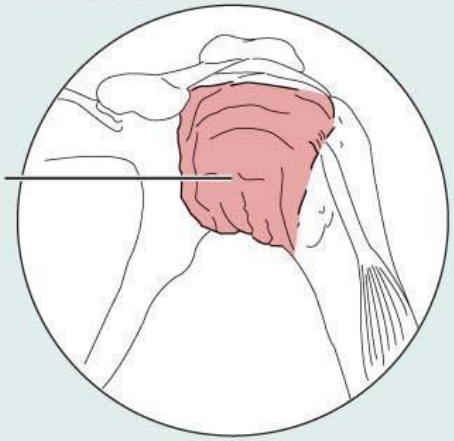


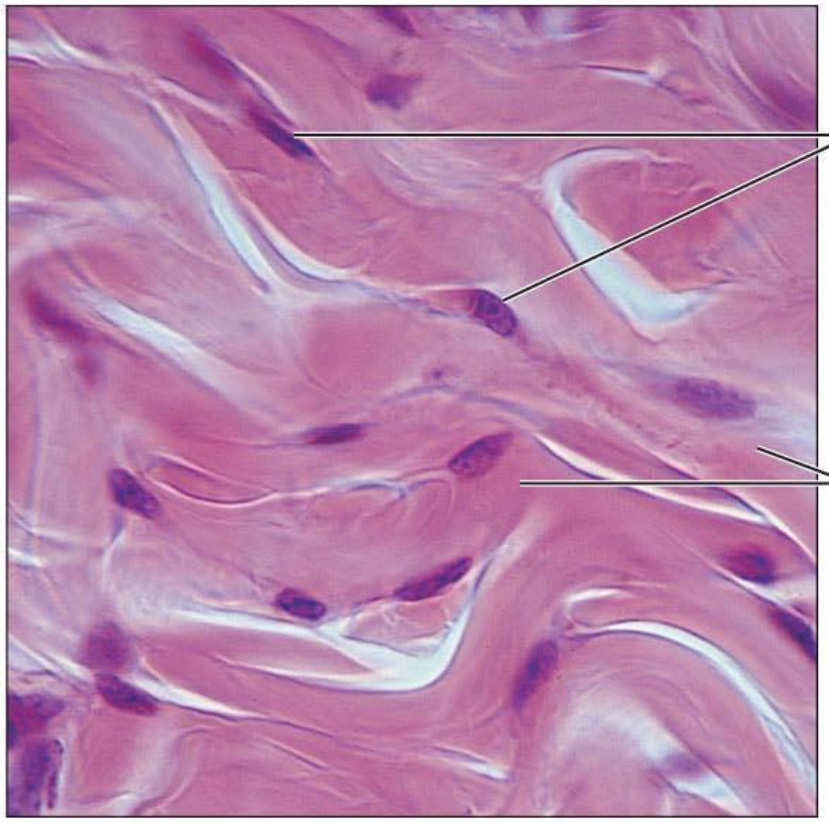
(e) Connective tissue proper: dense connective tissue, dense irregular

Description: Primarily irregularly arranged collagen fibers; some elastic fibers; major cell type is the fibroblast.

Function: Able to withstand tension exerted in many directions; provides structural strength.

Location: Fibrous capsules of organs and of joints; dermis of the skin; submucosa of digestive tract.

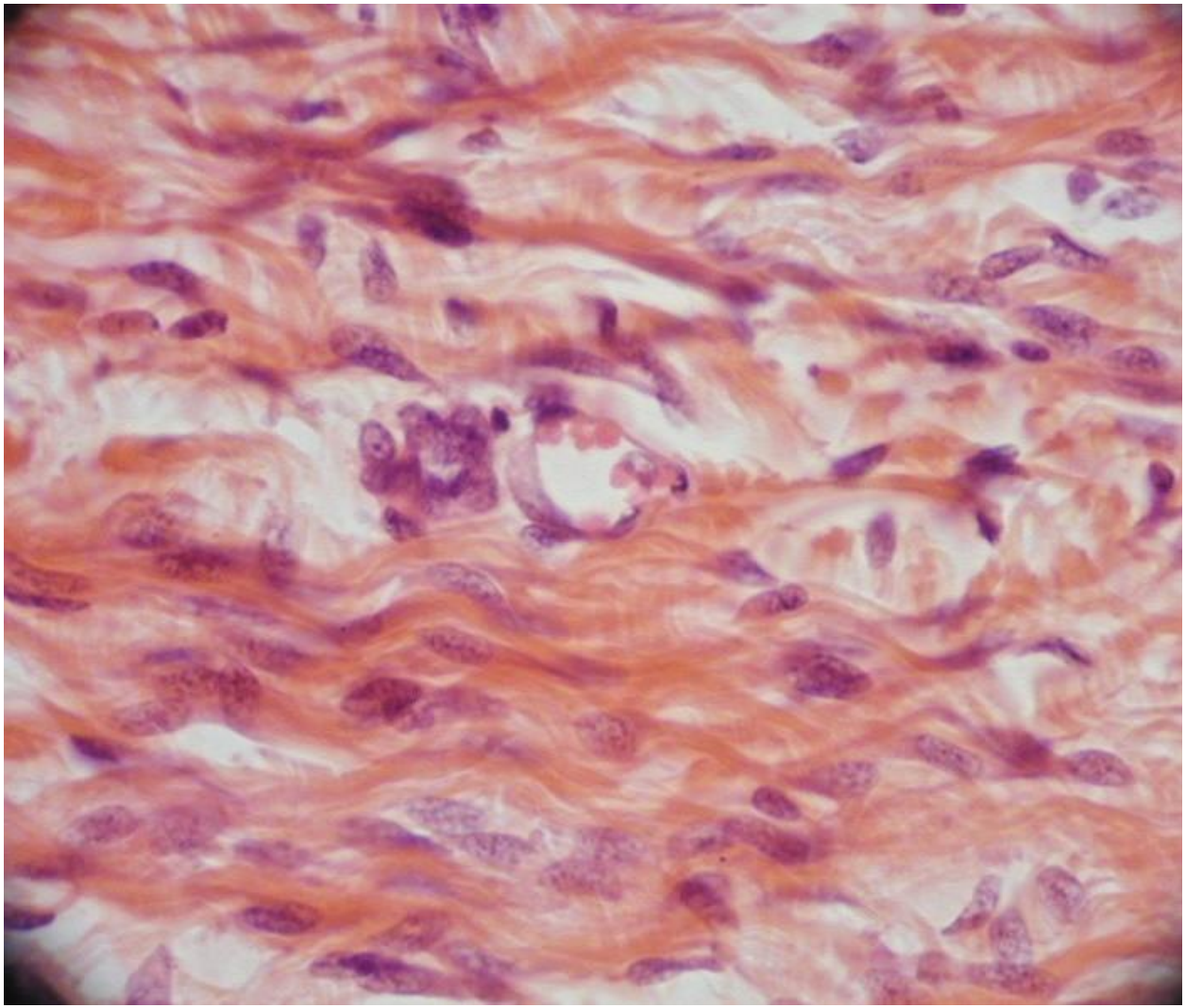




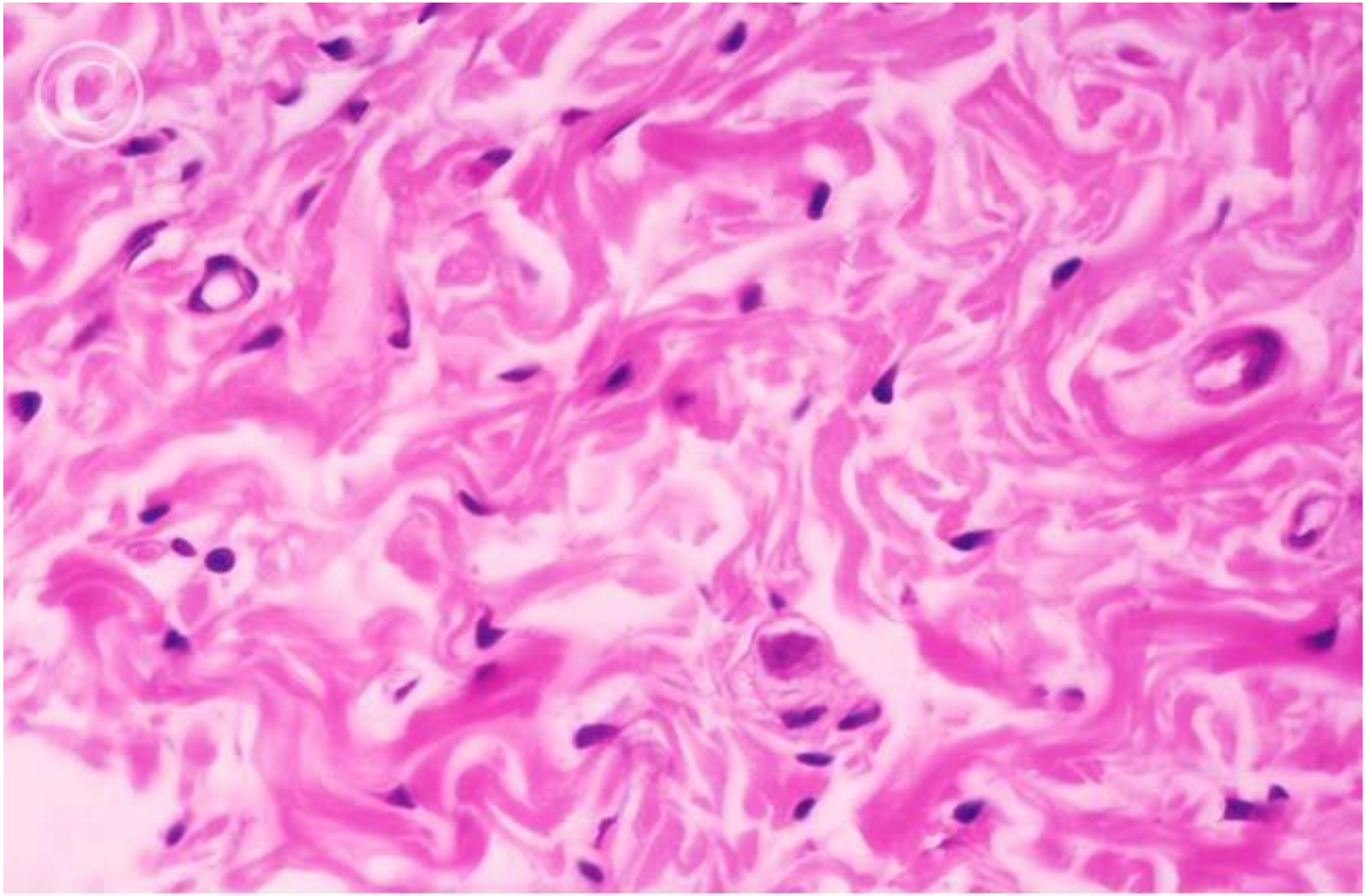
Photomicrograph: Dense irregular connective tissue from the dermis of the skin (400x).

Dense Connective Tissue: **Dense Irregular CT**

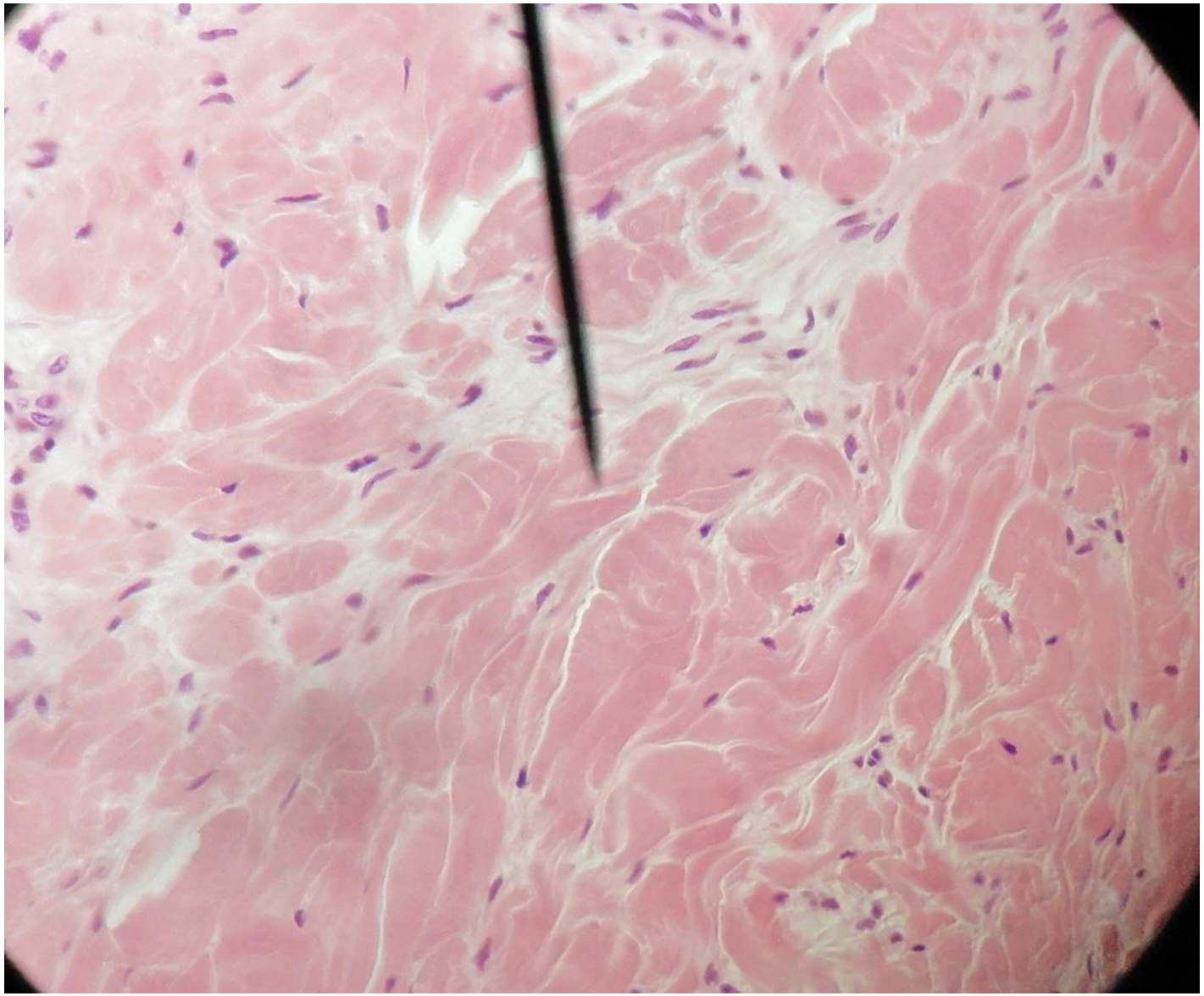
Find: collagen fibers, nuclei of fibroblasts



Dense Connective Tissue – Dense Irregular

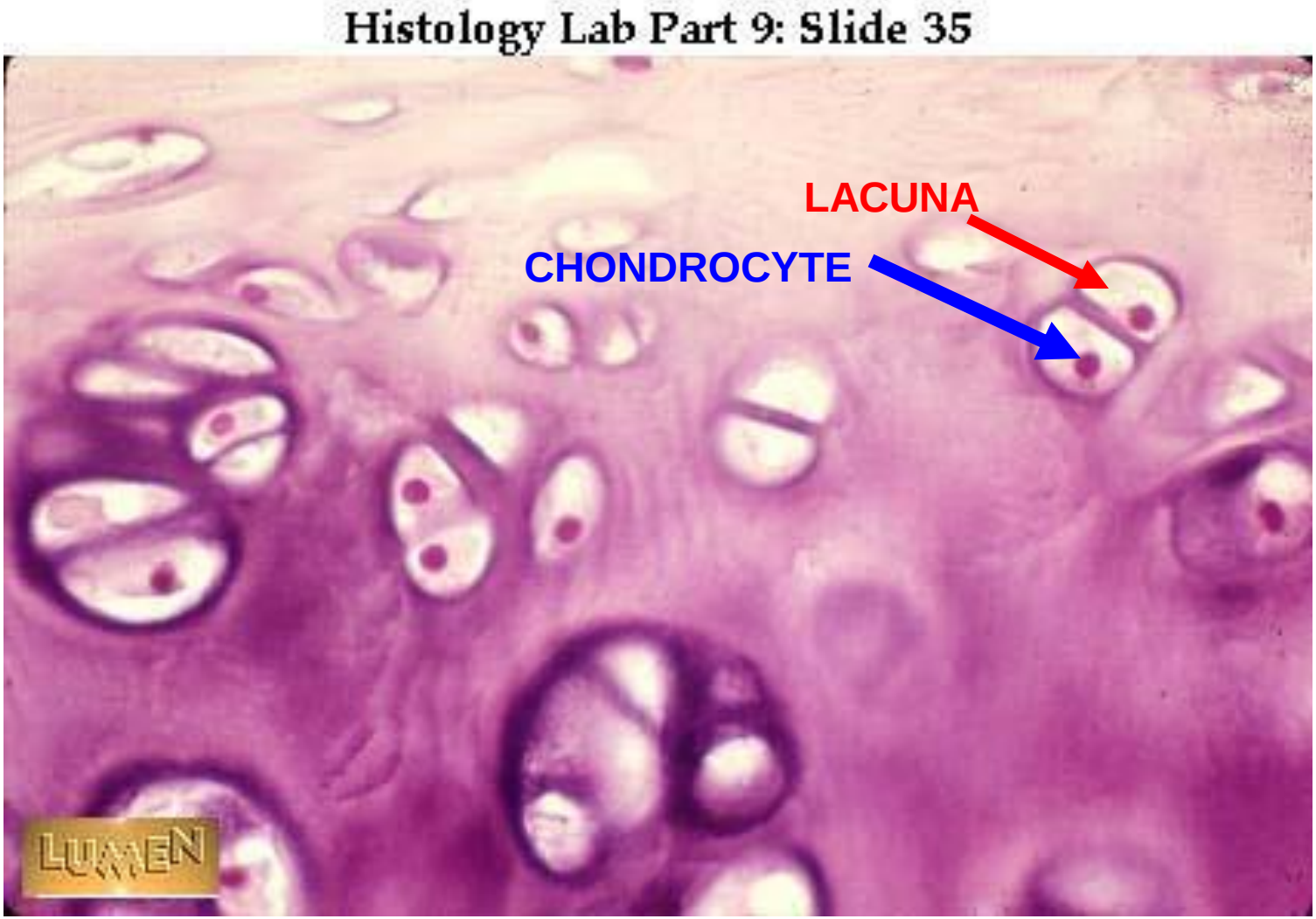


Dense Irregular Connective Tissue



Supportive Conective Tissue: **Hyaline Cartilage**

(Smooth and Clean Matrix!)

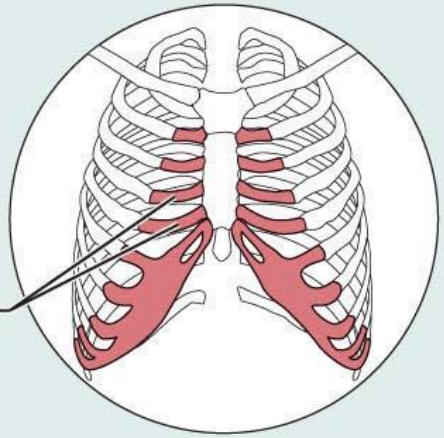


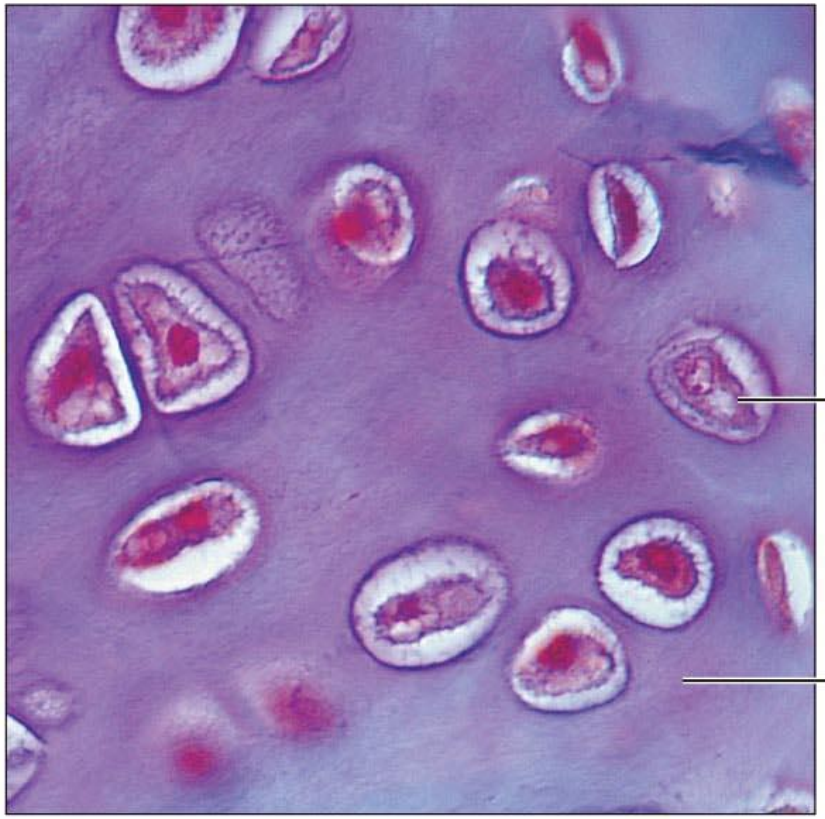
(g) Cartilage: hyaline

Description: Amorphous but firm matrix; collagen fibers form an imperceptible network; chondroblasts produce the matrix and when mature (chondrocytes) lie in lacunae.

Function: Supports and reinforces; has resilient cushioning properties; resists compressive stress.

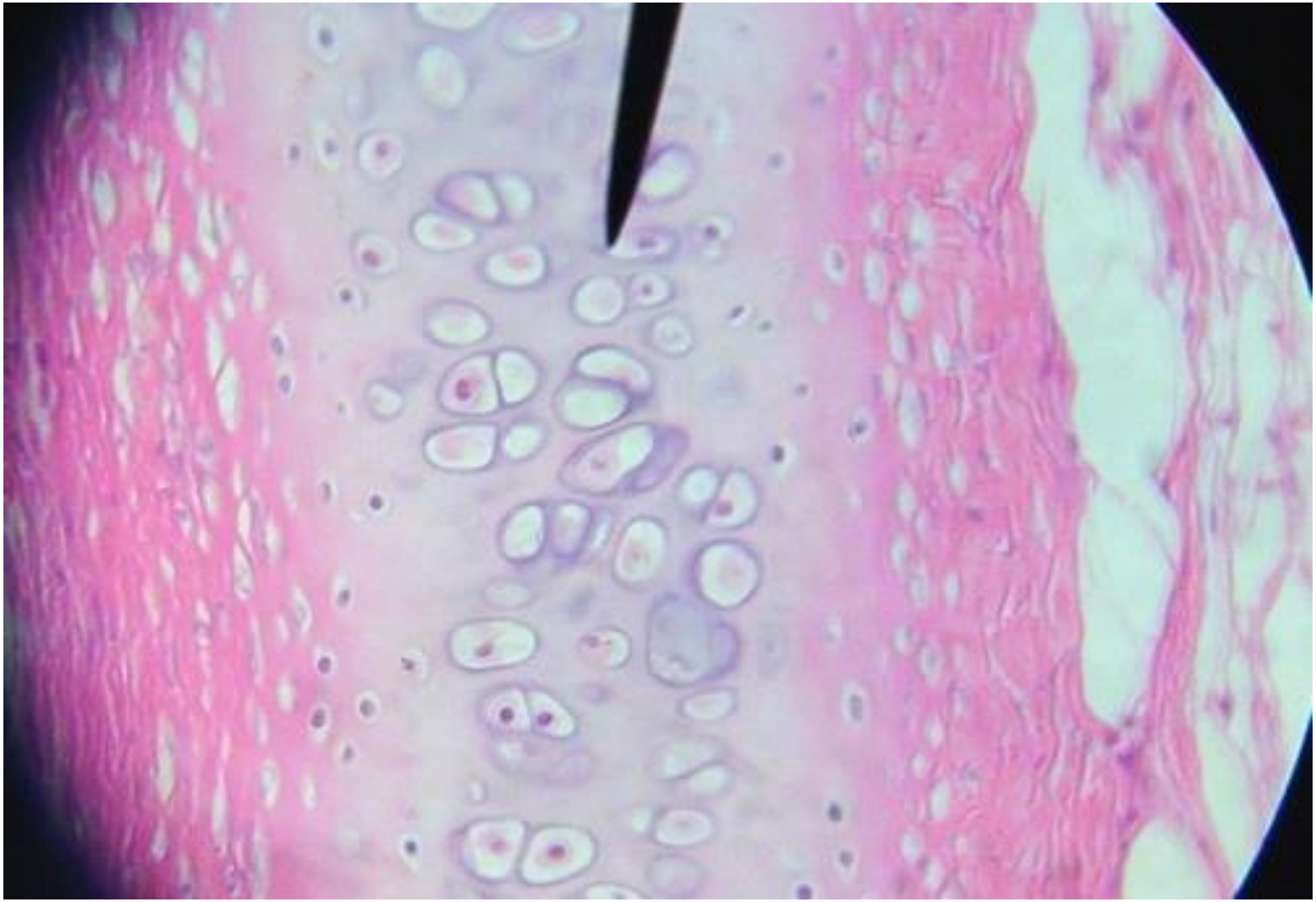
Location: Forms most of the embryonic skeleton; covers the ends of long bones in joint cavities; forms costal cartilages of the ribs; cartilages of the nose, trachea, and larynx.





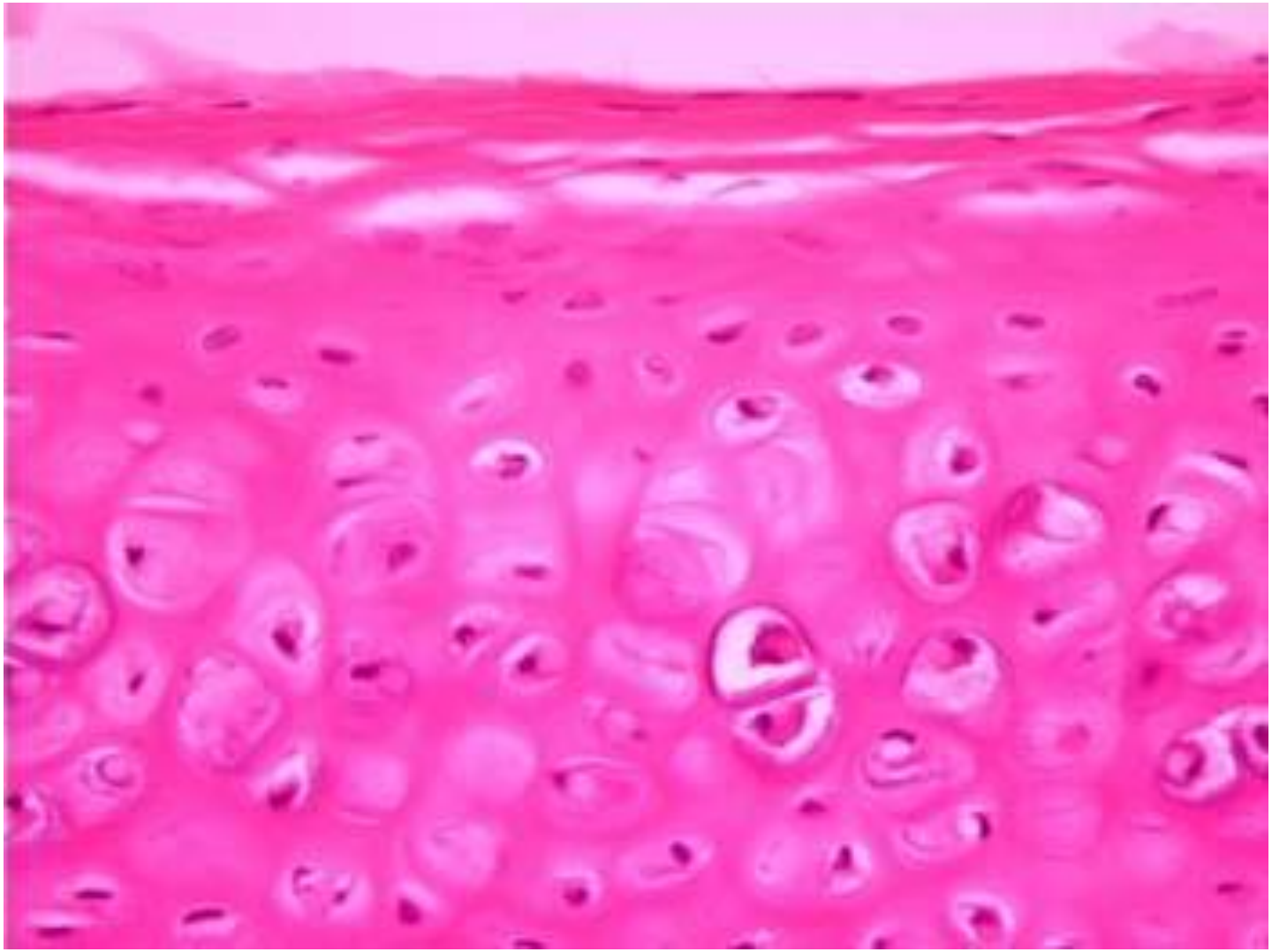
Photomicrograph: Hyaline cartilage from the trachea (750x).

Hyaline Cartilage



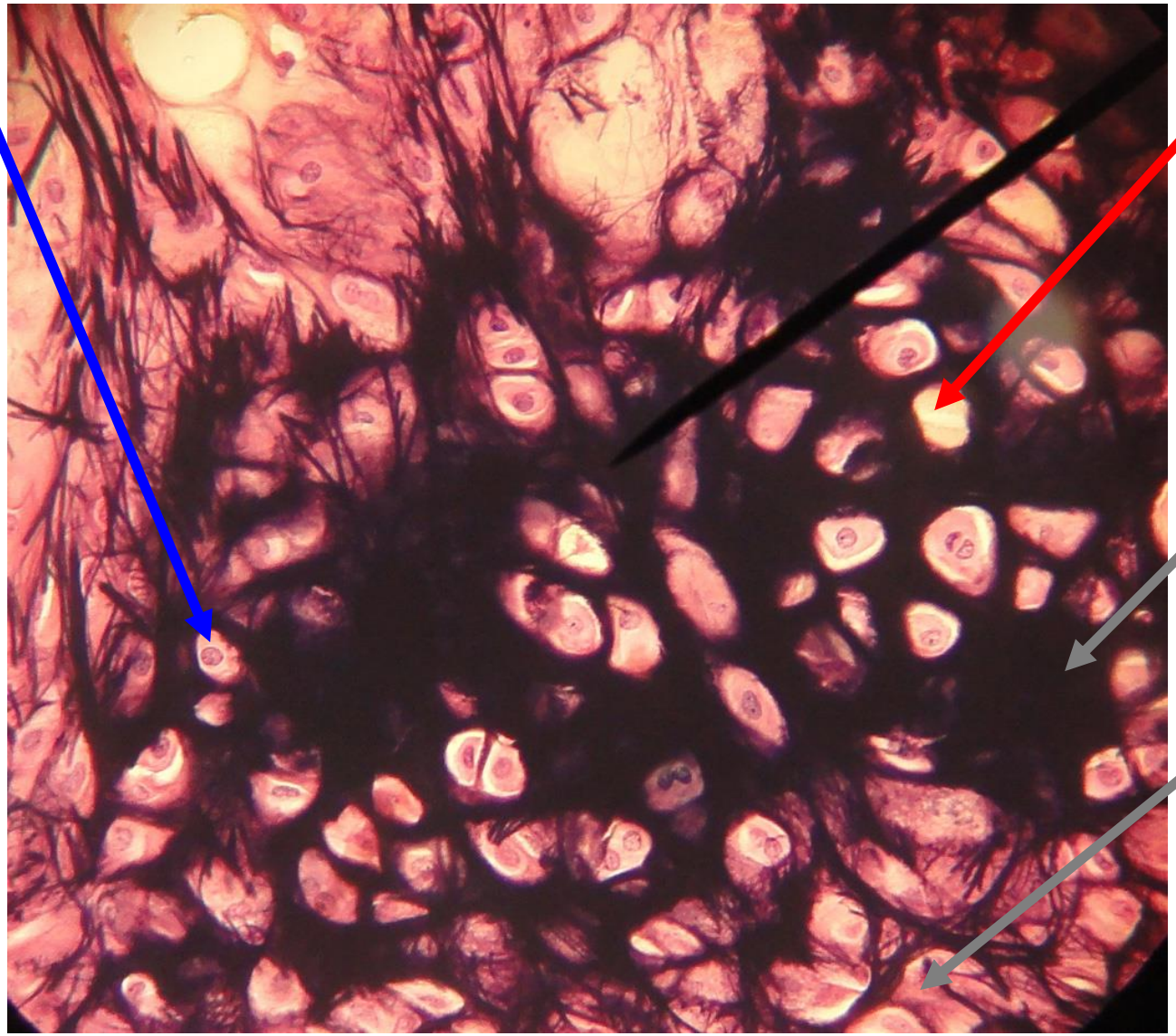
note the lacuna with a chondrocyte to the right of the pointer

Hyaline Cartilage



Supportive Connective Tissue: **Elastic Cartilage**

(Dirty Matrix!)

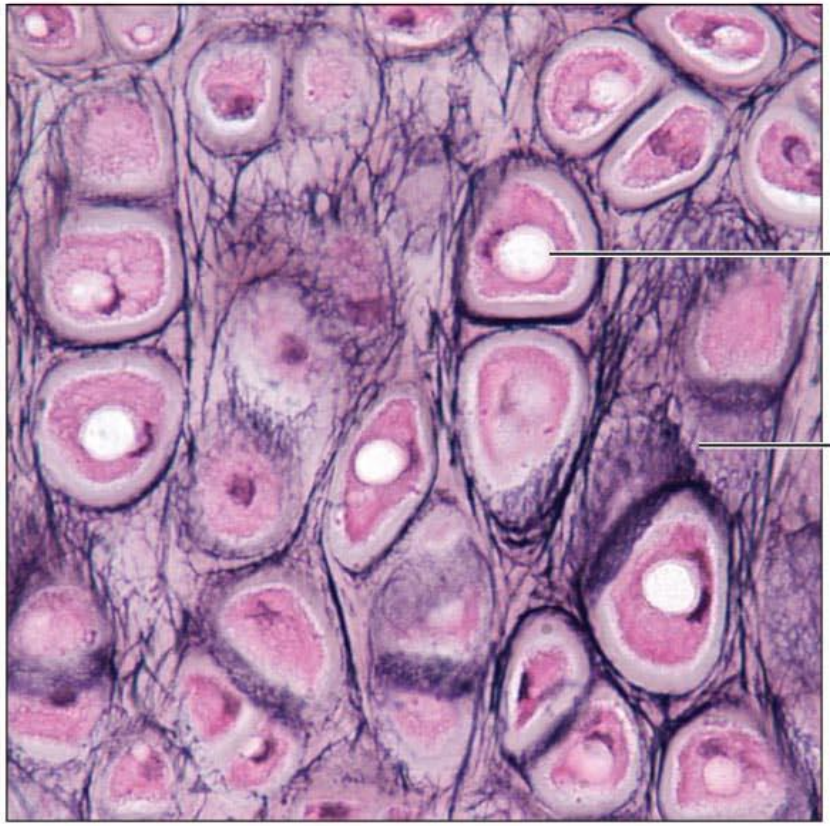


(h) Cartilage: elastic

Description: Similar to hyaline cartilage, but more elastic fibers in matrix.

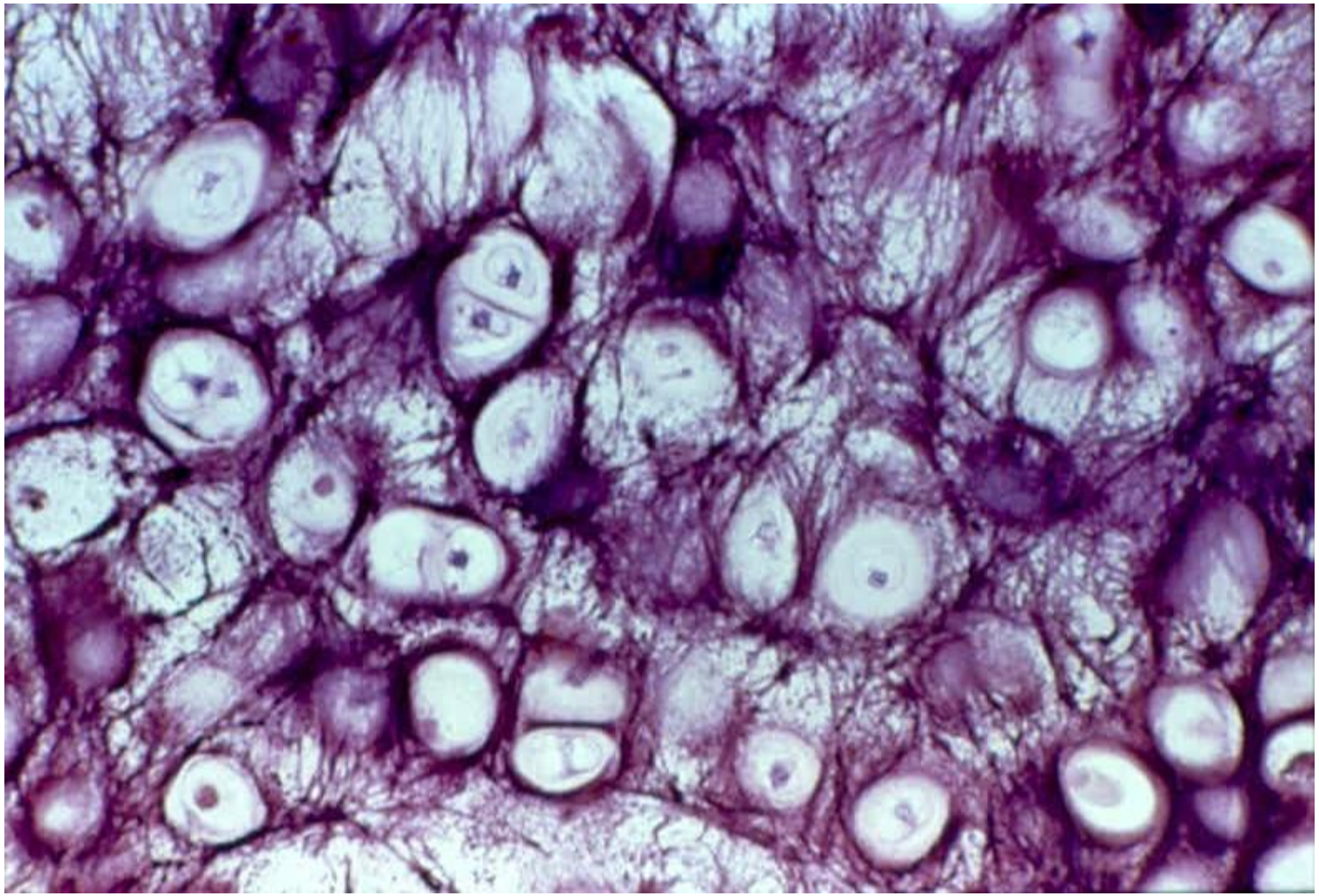
Function: Maintains the shape of a structure while allowing great flexibility.

Location: Supports the external ear (pinna); epiglottis.



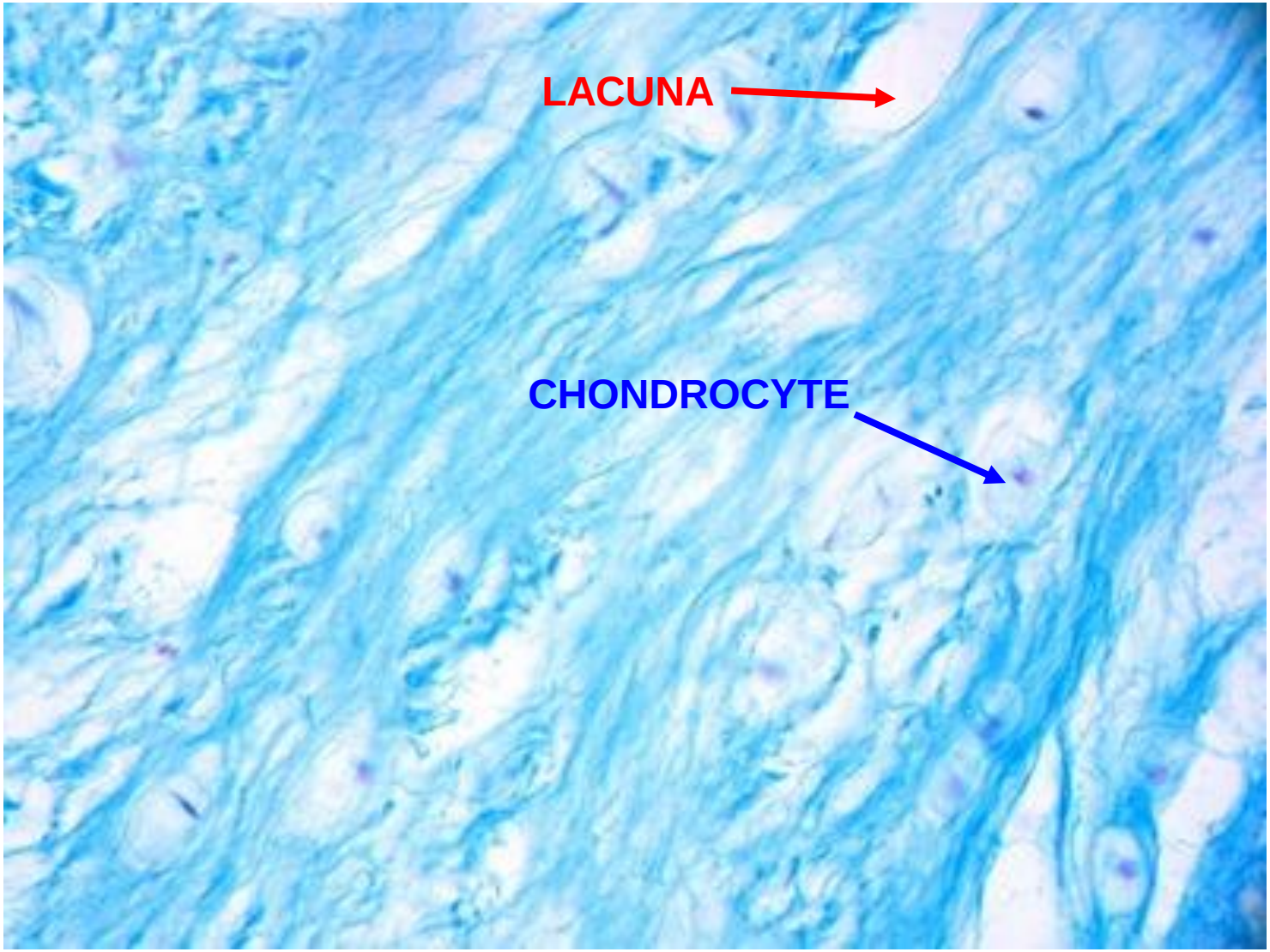
Photomicrograph: Elastic cartilage from the human ear pinna; forms the flexible skeleton of the ear (800x).

Elastic Cartilage



Supportive Connective Tissue: **Fibrocartilage or Fibrous Cartilage**

(Matrix looks like water, lacuna with chondrocytes look like boats)

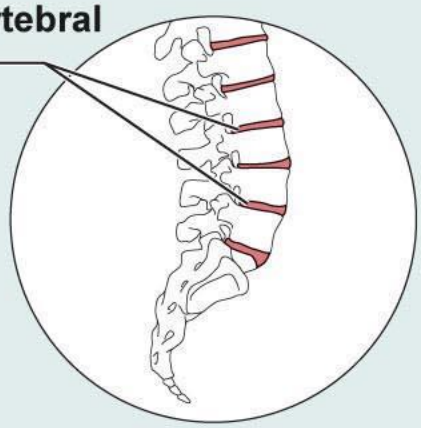


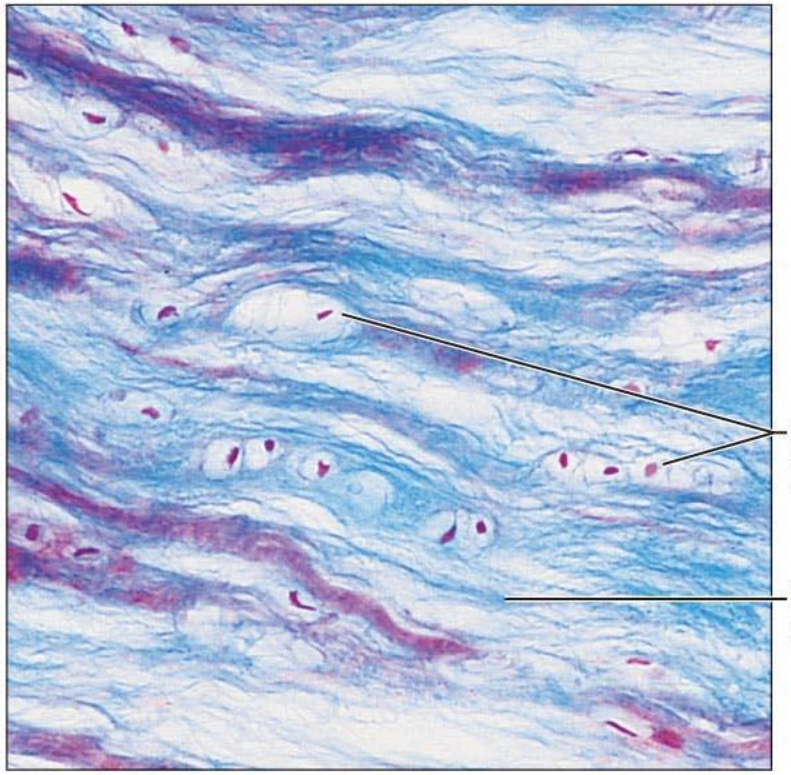
(i) Cartilage: fibrocartilage

Description: Matrix similar to but less firm than that in hyaline cartilage; thick collagen fibers predominate.

Function: Tensile strength with the ability to absorb compressive shock.

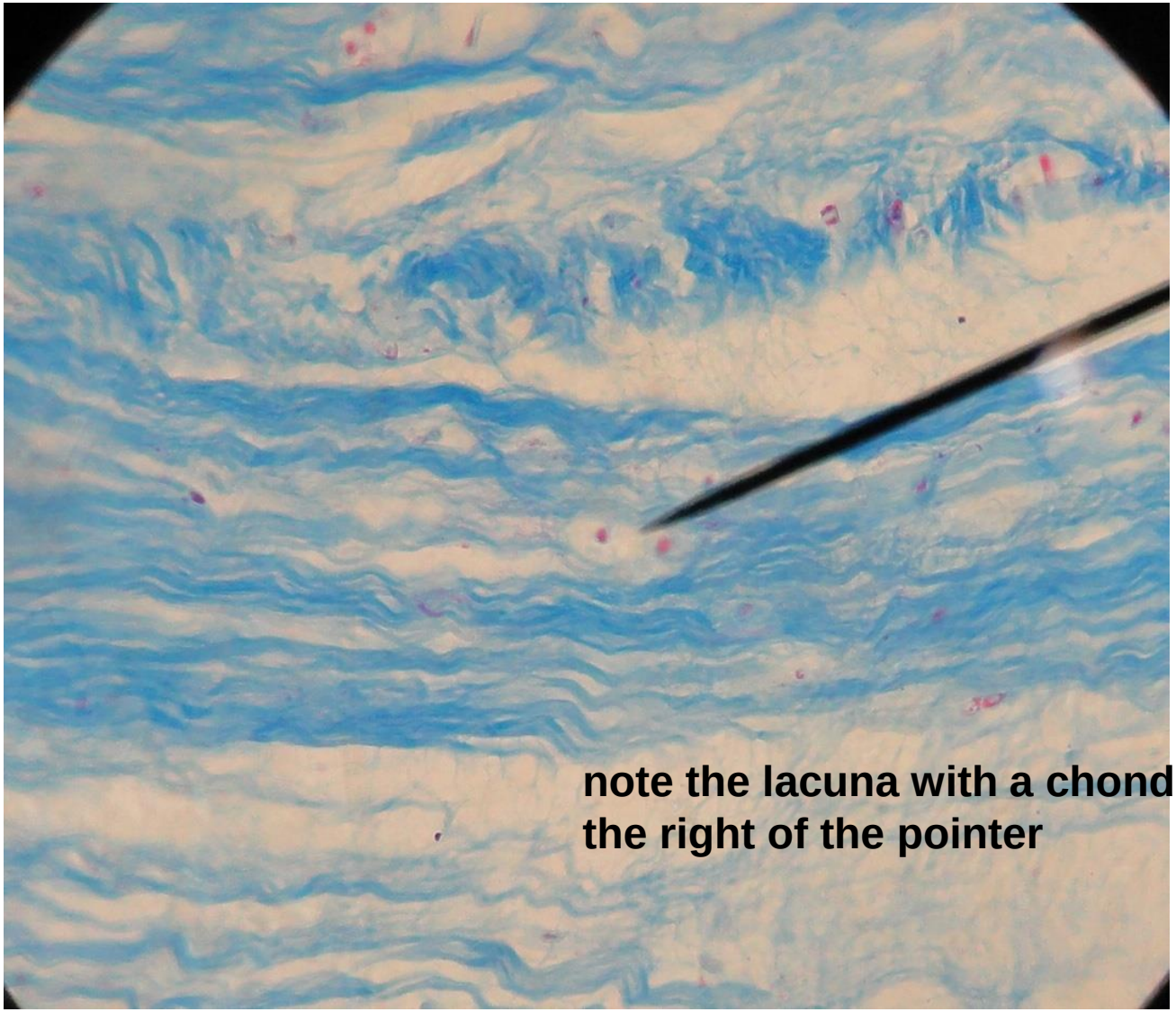
Location: Intervertebral discs; pubic symphysis; discs of knee joint.



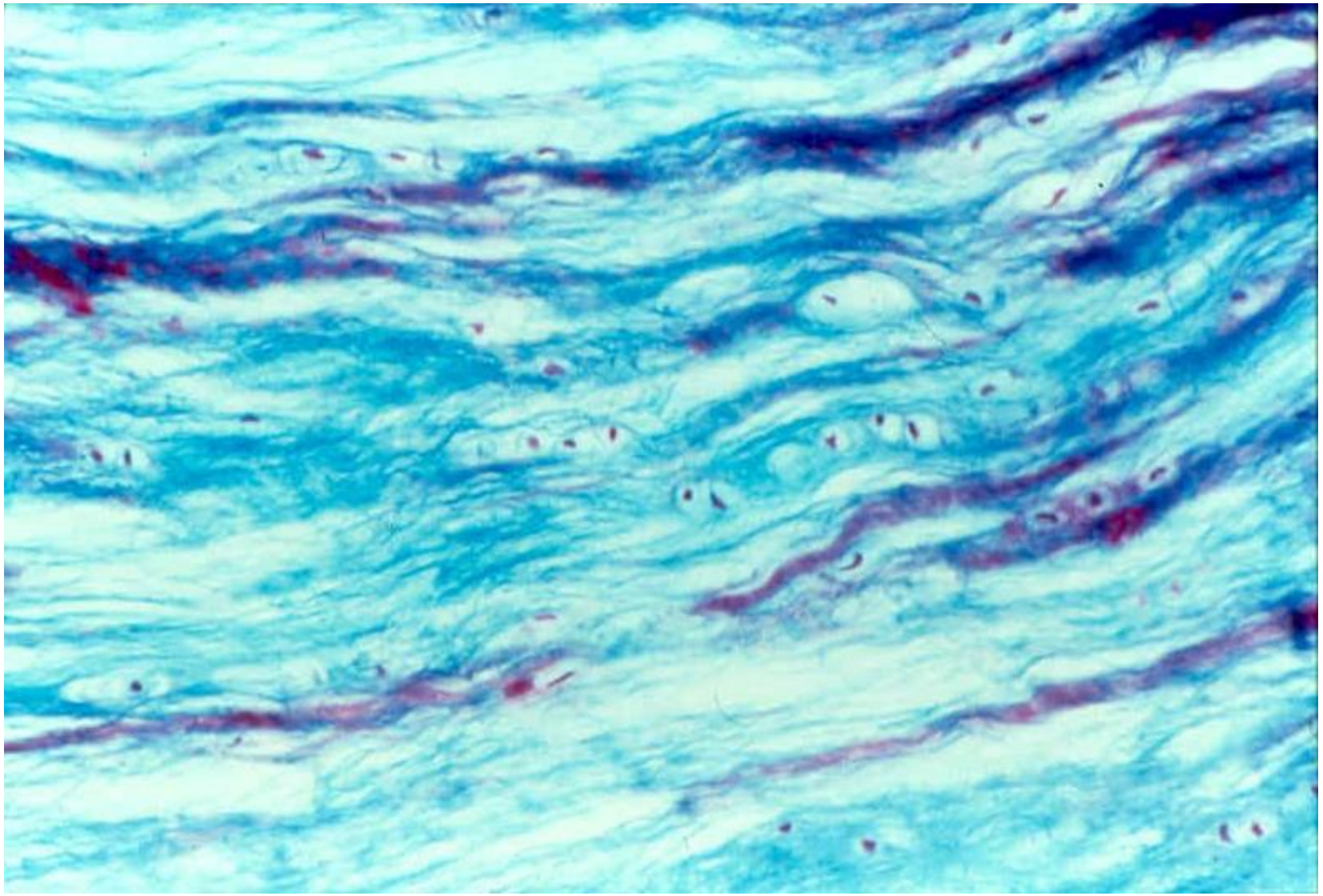


Photomicrograph: Fibrocartilage of an intervertebral disc (125x). Special staining produced the blue color seen.

Fibrocartilage or Fibrous Cartilage



Fibrocartilage or Fibrous Cartilage



There is a Histology Practice Test on my webpage!

- Use it to study and review!
- http://www.cypressbiologysato.com/
  - Click on “Image Gallery” Then click on Lab Exam 1