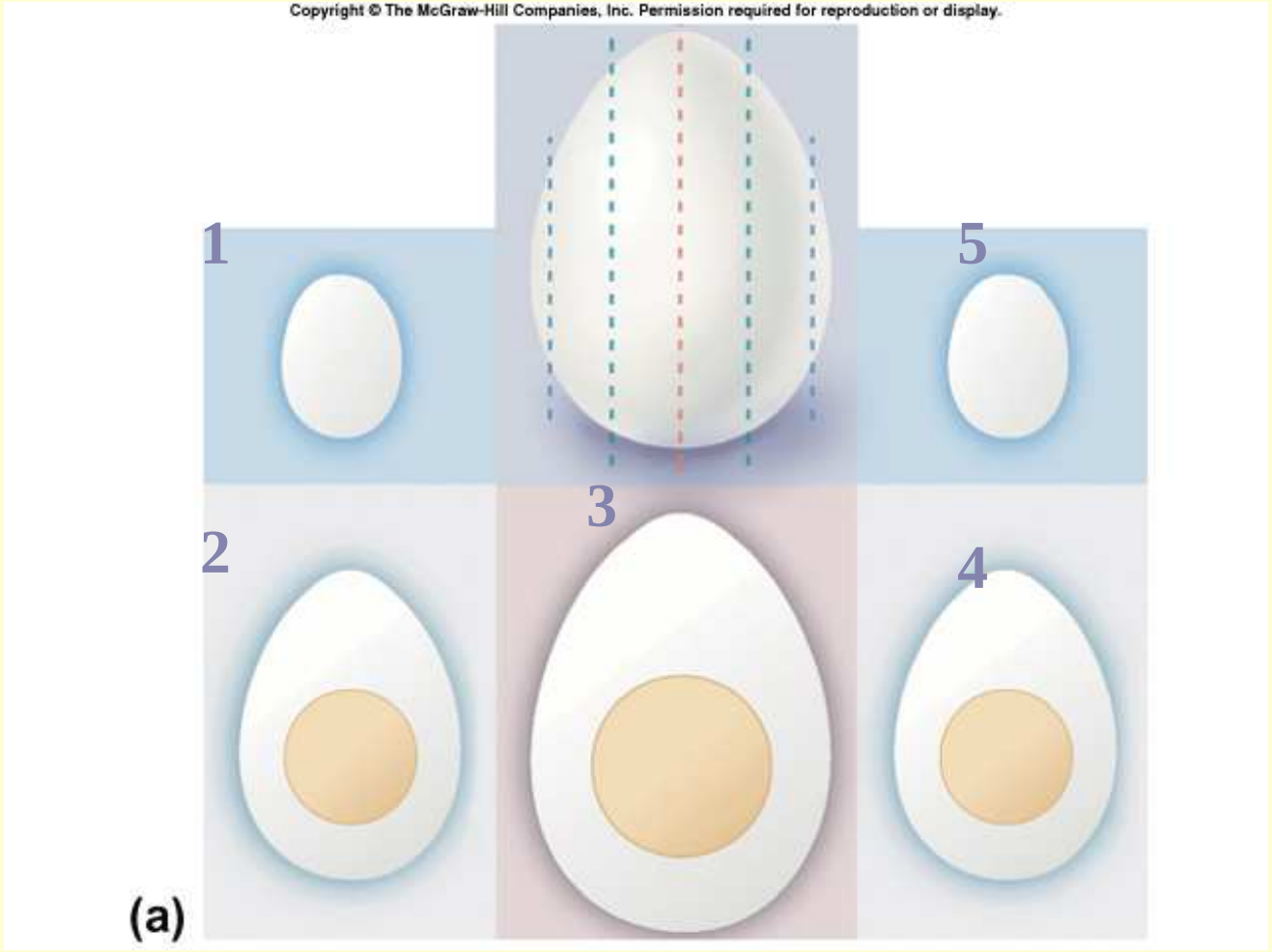
Histology

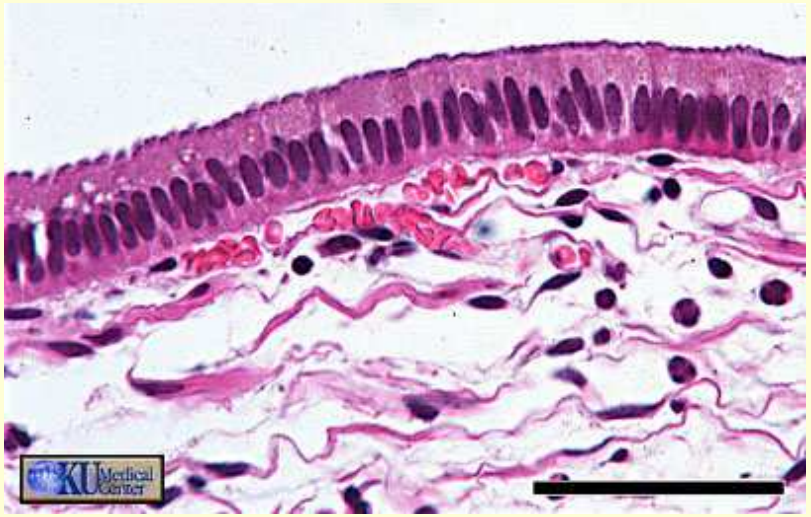
Tissue Sectioning

1 2 3 4 5



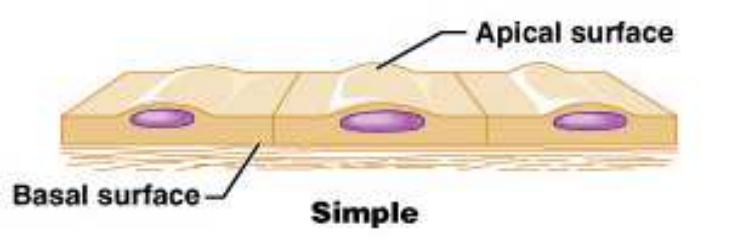
Epithelial Tissues

- No intercellular matrix.
- Avascular
- Contains nerve endings
- Lie on a basement membrane.
- Able to undergo mitosis.
- Develop from all three fetal tissues.
- One surface of cells is exposed to a space or cavity.

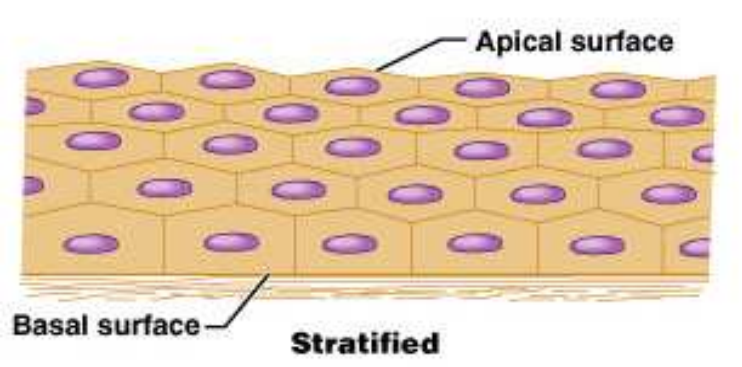


Classifications of Epithelia

- First name of tissue indicates number of layers
  - Simple –



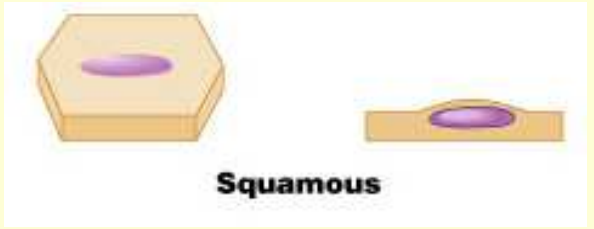
  - Stratified – of cells

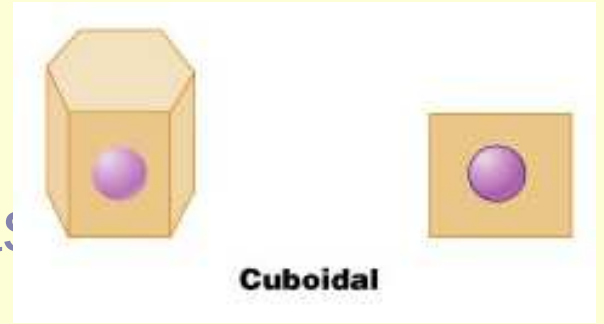


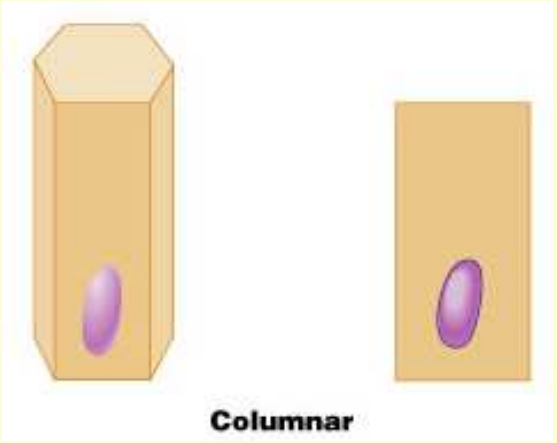
Classifications of Epithelia

- Last name of tissue describes shape of cells
  - Squamous – cells wider than tall (plate or “scale” like)
  - Cuboidal – cells are as wide as tall, as in cubes

Columnar – cells are taller than they are wide, like columns

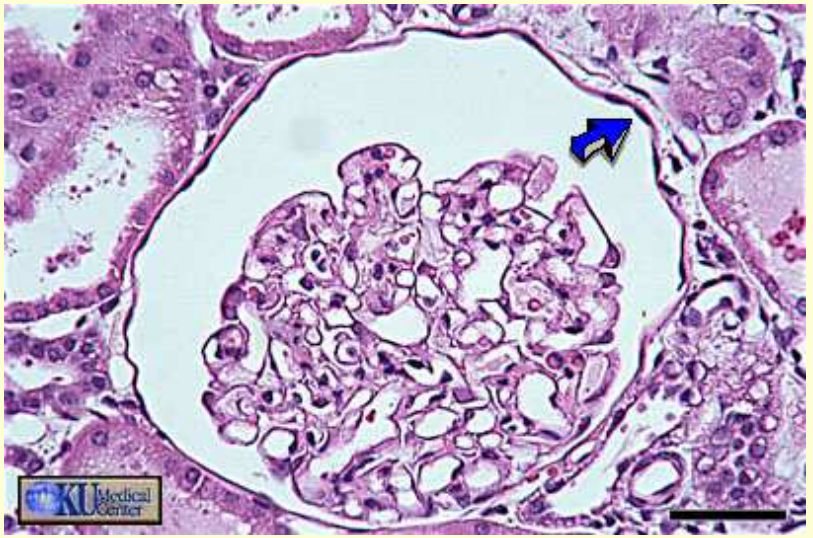






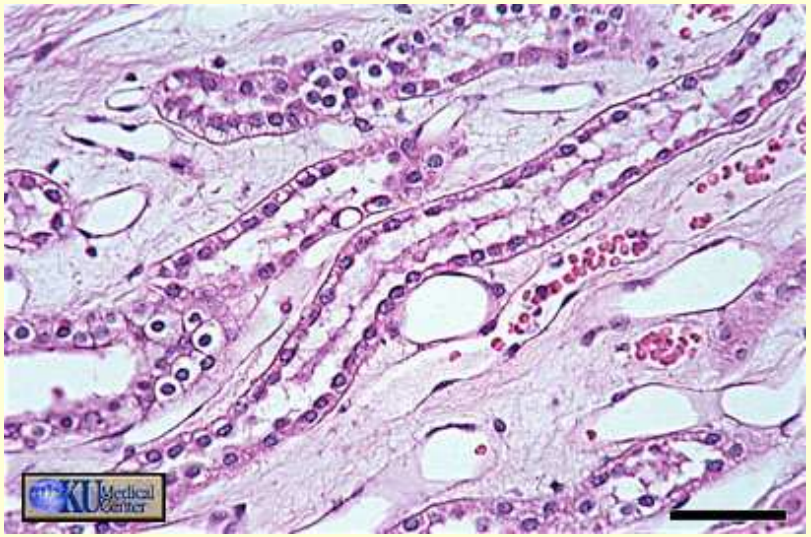
Epithelial Tissues

- Simple Squamous Epithelium
  - Single layer of cells.
  - Cells are longer than they are wide.
  - Nuclei tend to bulge into a space.



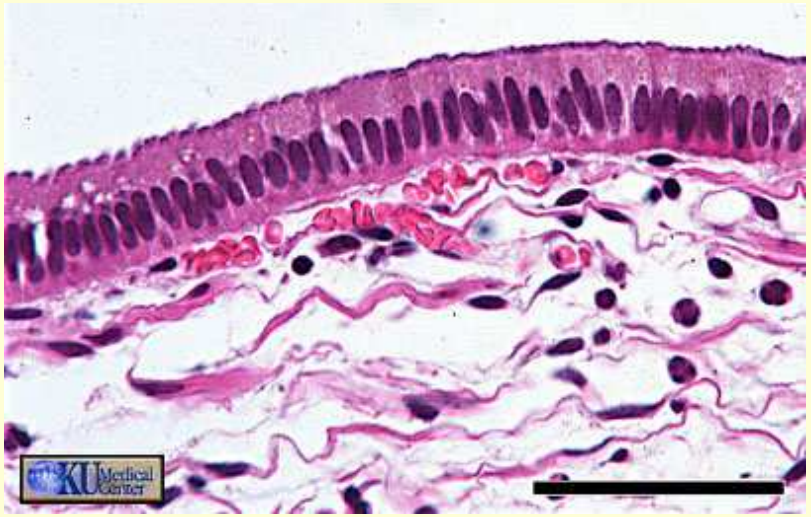
Epithelial Tissues

- Simple cuboidal epithelium
  - Single layer of cells
  - Width of cell is roughly equal to height of cell.
  - Fxns



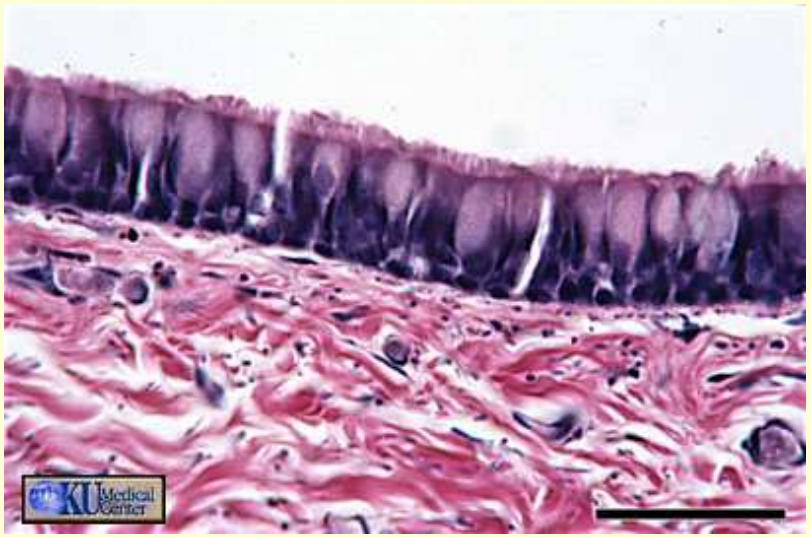
Epithelial Tissues

- Simple Columnar Epithelium
  - Single layer of cells
  - Height of cells is greater than cell width.
  - Fxns



Epithelial Tissues

- Pseudostratified ciliated columnar
  - Actually a simple epithelium – every cell touches the basement membrane.
  - Contains goblet cells.

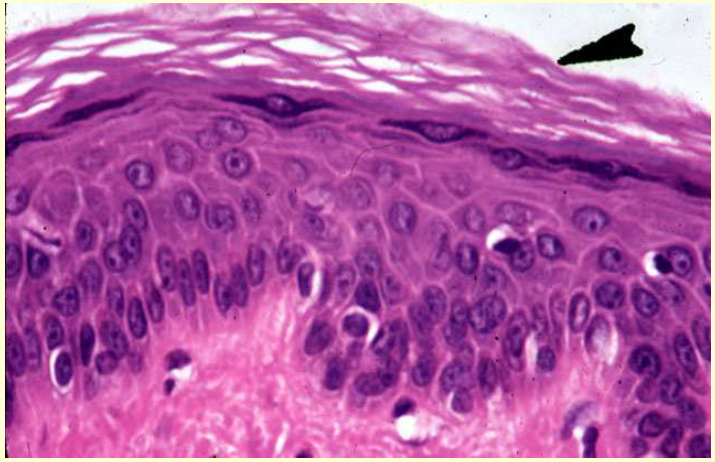


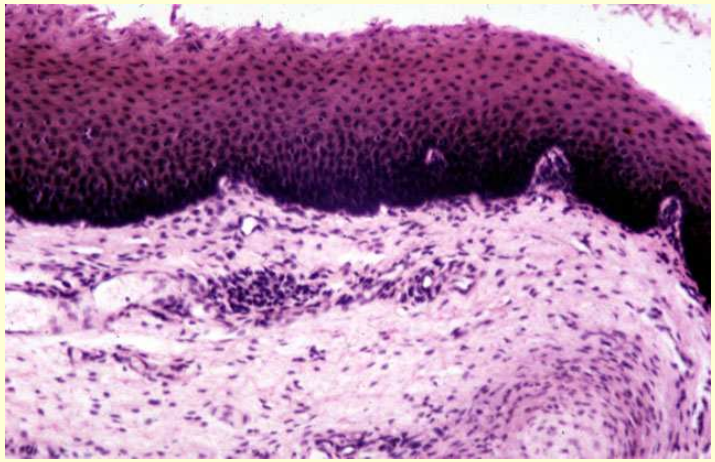
Epithelial Tissues

- Transitional Epithelium
  - Located in urinary bladder and ureters only.
  - Transitions from stratified cuboidal to stratified squamous

Epithelial Tissues

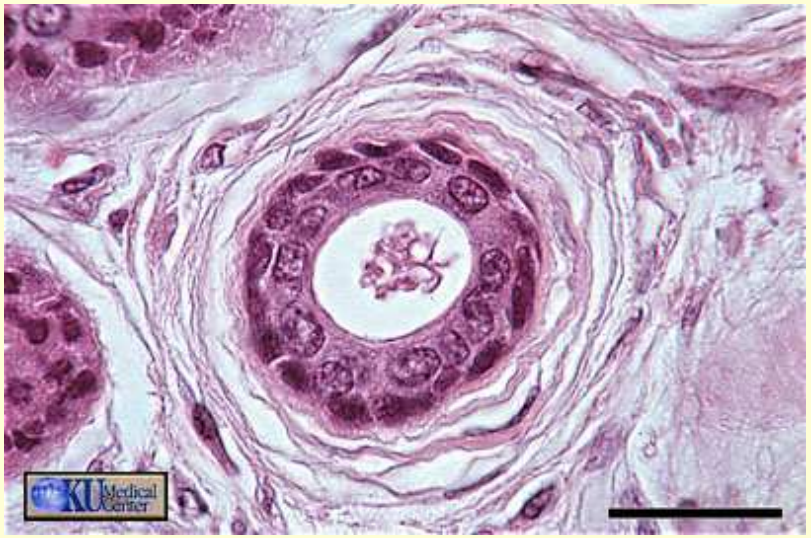
- Stratified Squamous
  - When you are looking at a stratified epithelium, to identify the shape of the cells always look at the top most layer.
  - Stratified Squamous Epithelium is either keratinized or non-keratinized



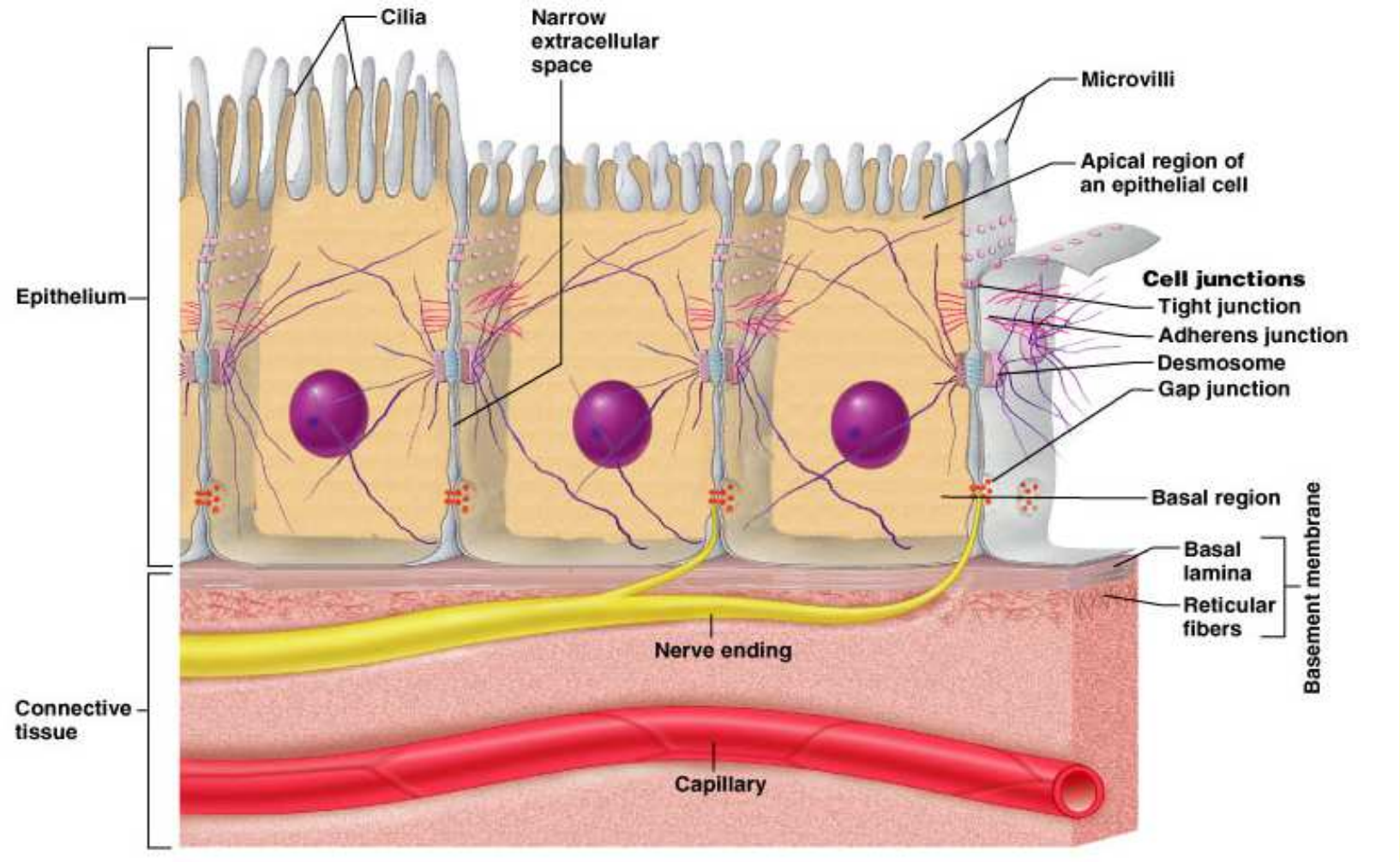


Epithelial Tissues

- Stratified Cuboidal
  - Located primarily in ducts of glands

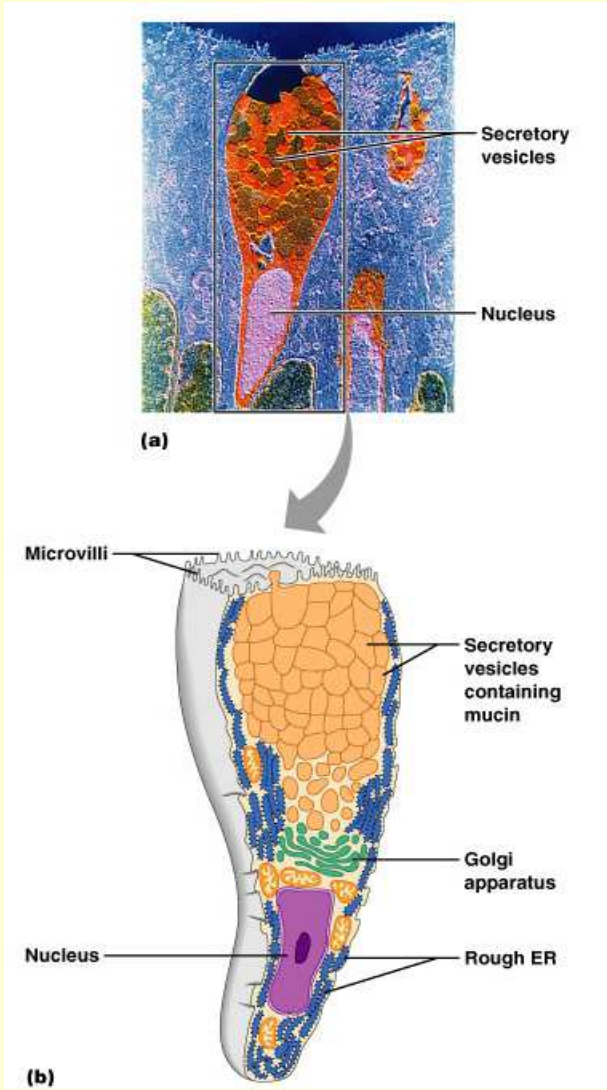


Special Characteristics of Epithelia

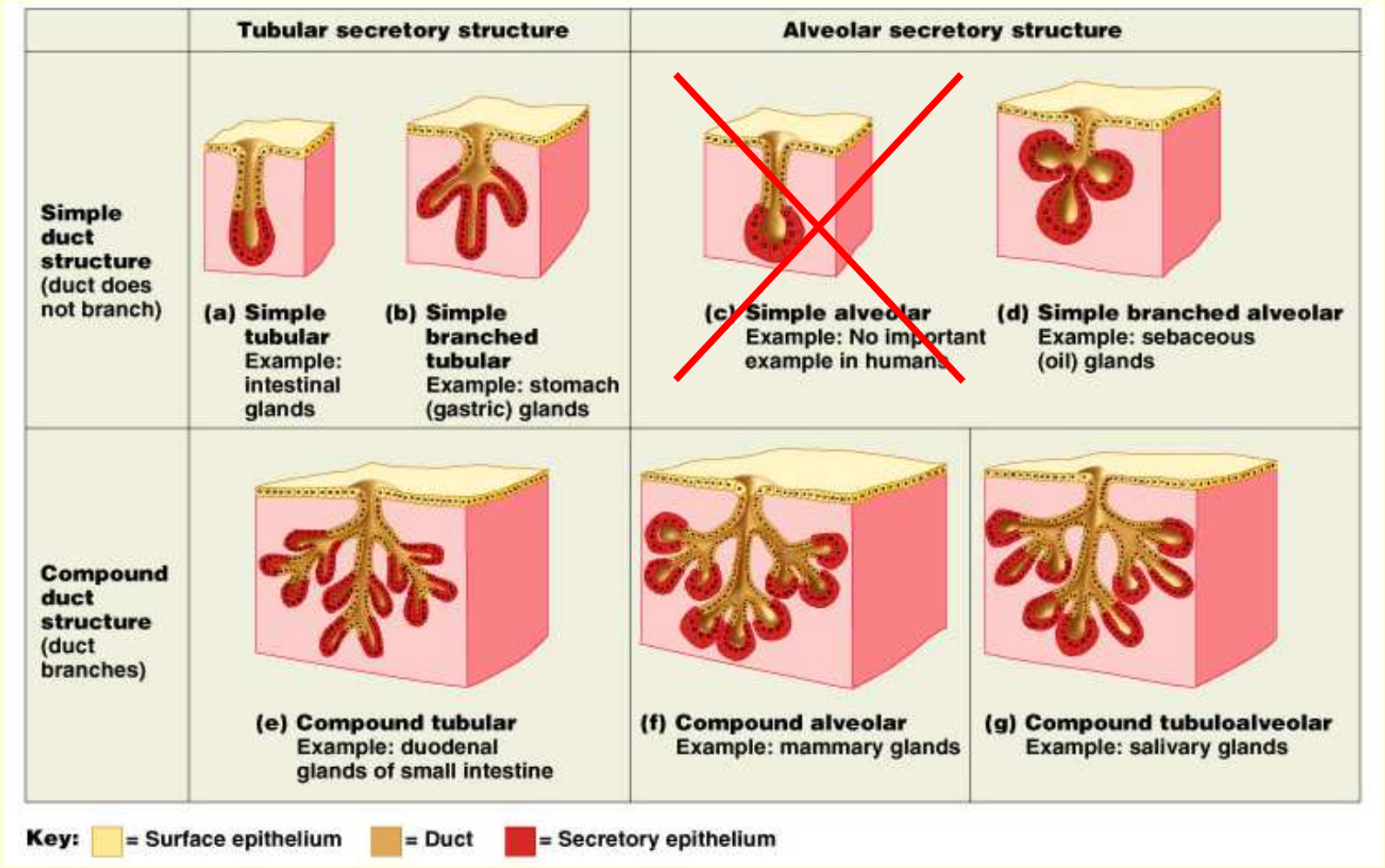


Unicellular Exocrine Glands (The Goblet Cell)

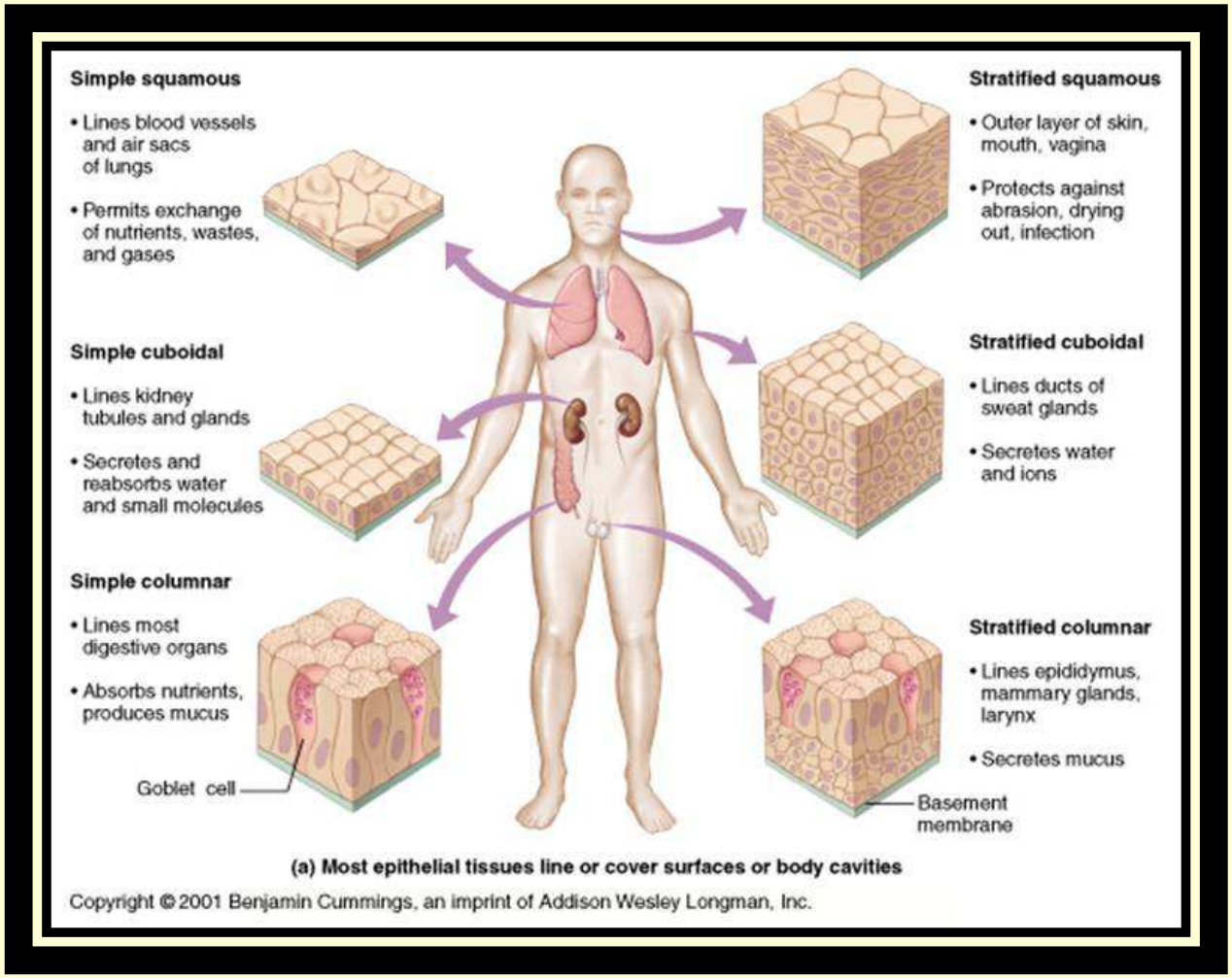
- Goblet cells produce mucin
- Mucin + water → mucus
- Protects and lubricates many internal body surfaces



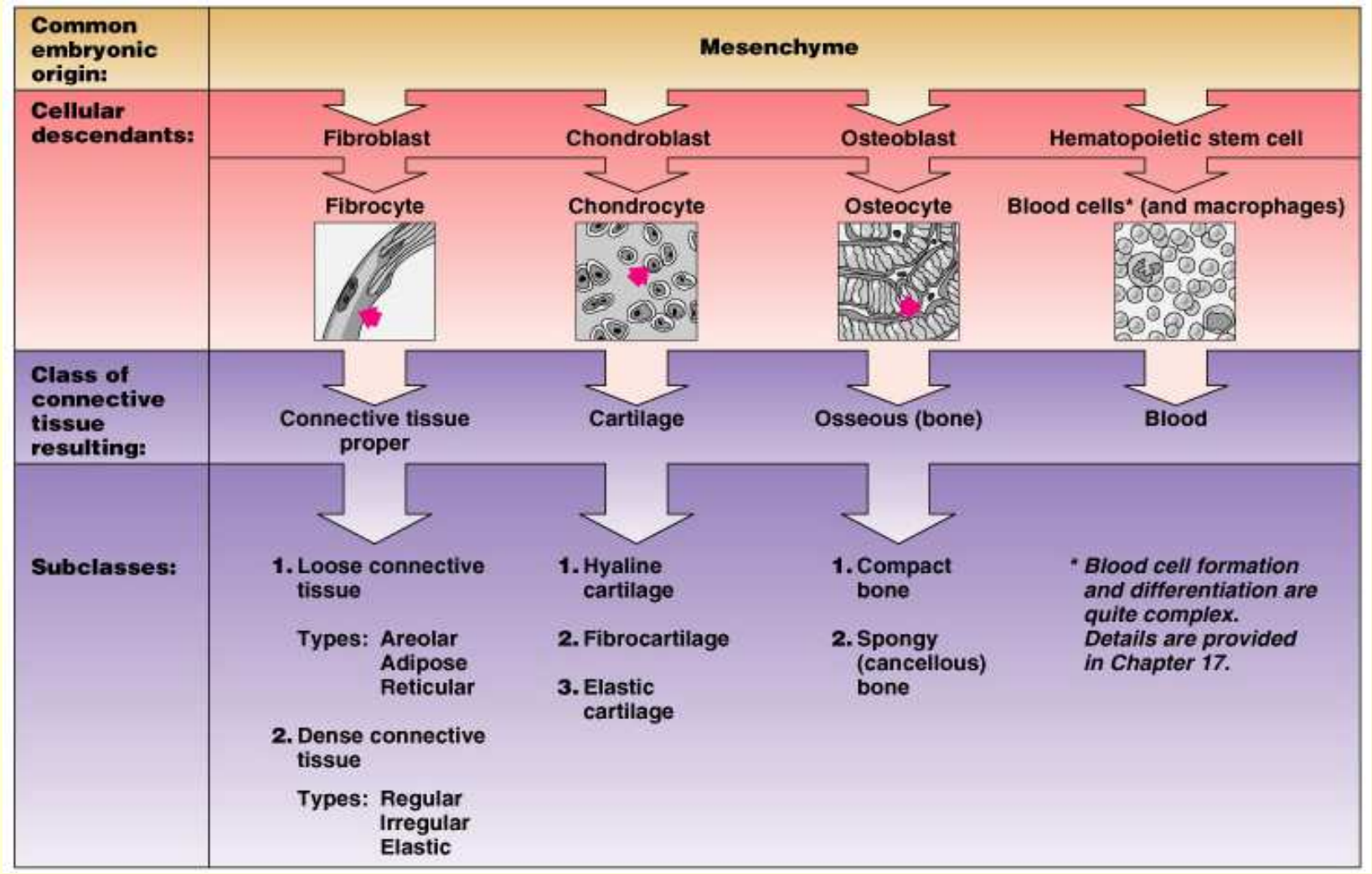
Types of Multicellular Exocrine Glands



Aim: How do epithelial tissues differ?

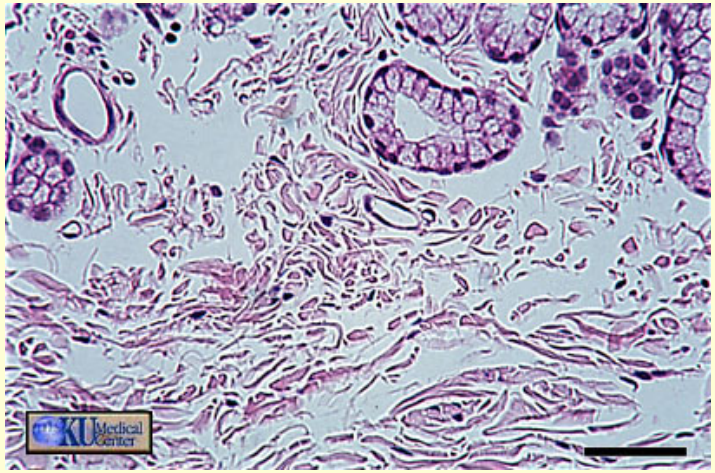


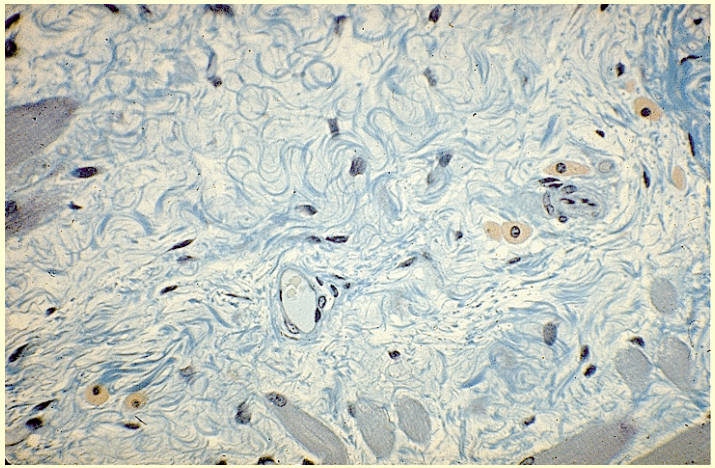
Classes of Connective Tissue



Connective Tissue

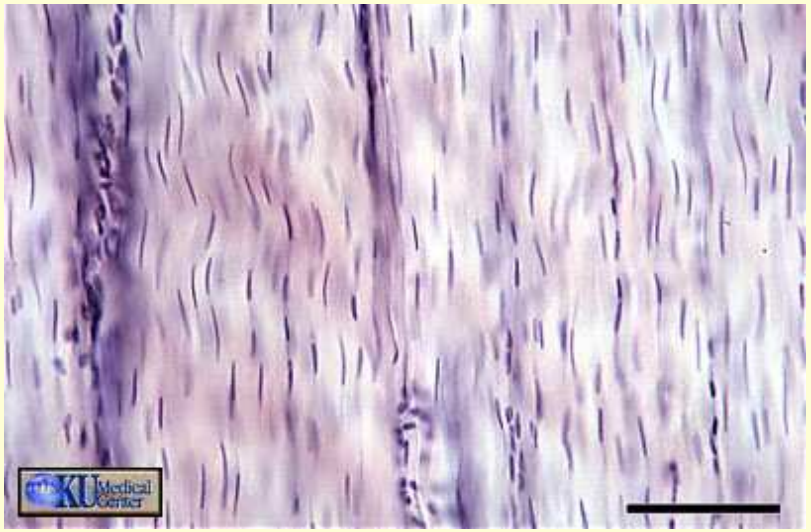
- Connective Tissue Proper
  - Loose areolar connective tissue.
    - Found in most tissues of the body.





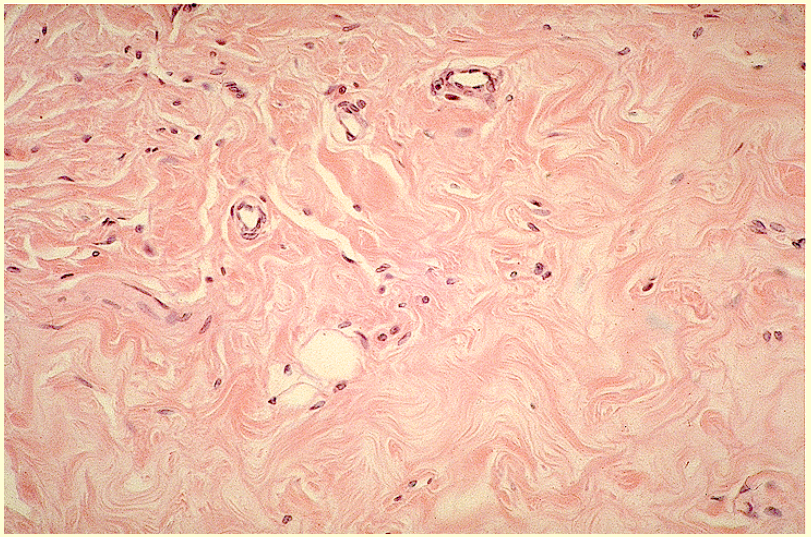
Connective Tissue

- Connective Tissue Proper
  - Dense Regular Connective Tissue
    - Collagen fibers run parallel to one another.
    - Note cells of dense regular c.t., called fibrocytes, are located between collagen fibers.



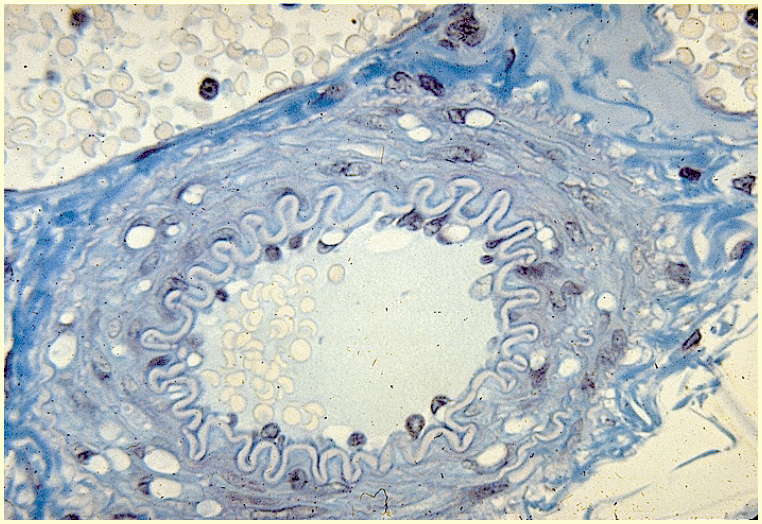
Connective Tissue

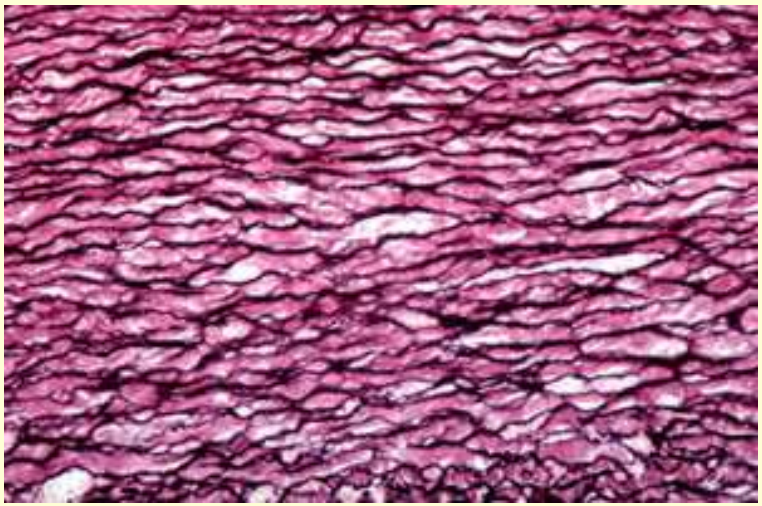
- Connective Tissue Proper
  - Dense Irregular connective tissue.



Connective Tissue

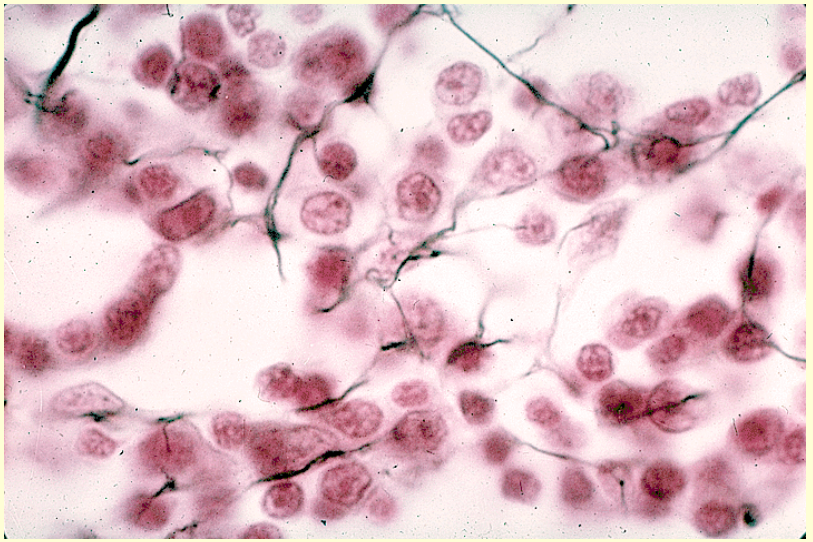
- Connective Tissue Proper
  - Elastic connective tissue





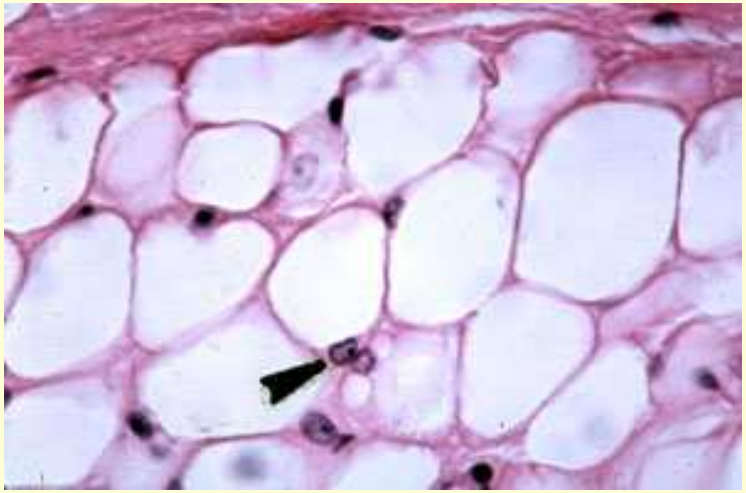
Connective Tissue

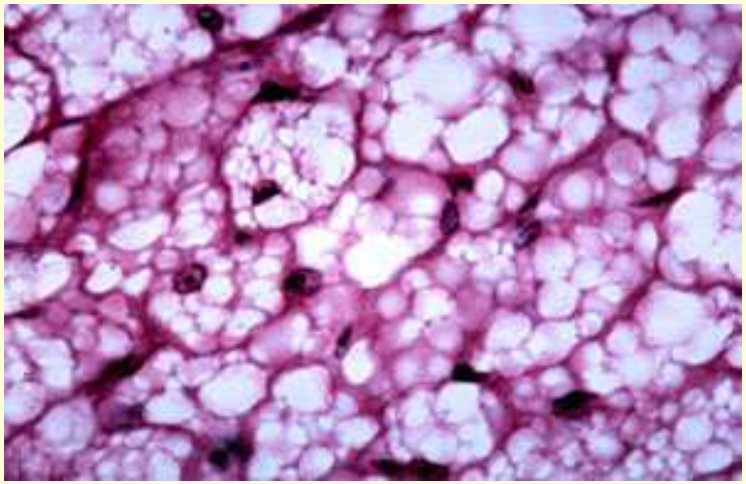
- Connective Tissue Proper
  - Reticular connective tissue



ConnectiveTissue

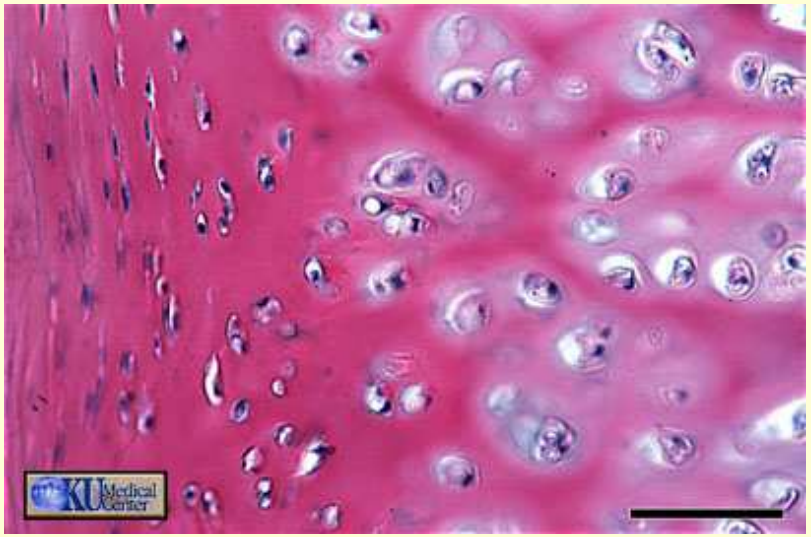
- Connective Tissue Proper
  - Adipose connective tissue.
    - Brown adipose tissue is found in newborns and hibernating animals.





Connective Tissue

- Hyaline Cartilage
  - Most abundant cartilage.
  - Located in most joints.
  - Precursor to most long bones of body.
    - Note how cells of hyaline cartilage ‘bunch up’.
    - Note how chondrocytes ‘shrink’ away from their lacunae (pockets within semisolid intercellular matrix of cartilage) – characteristic of cartilage.

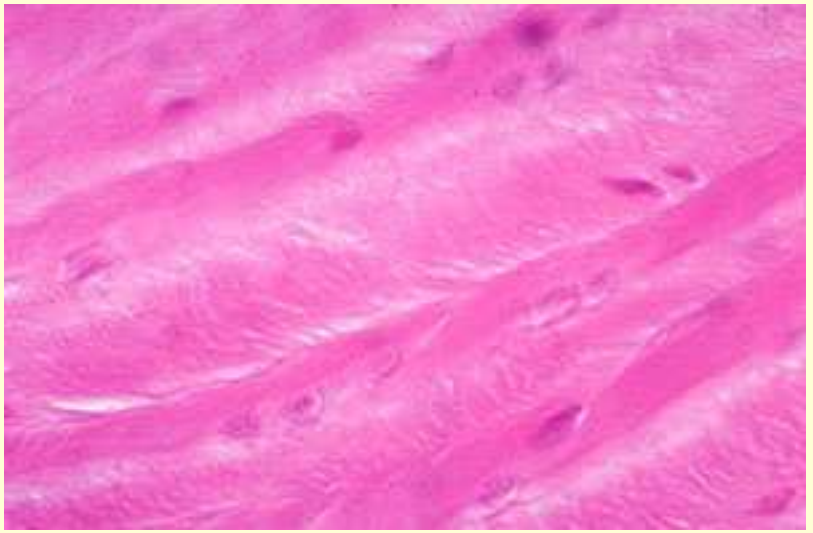


Connective Tissue

- Elastic Cartilage
  - In order to see elastic proteins in elastic cartilage a special stain is used.
    - Elastic fibers will stain gray to black in color.

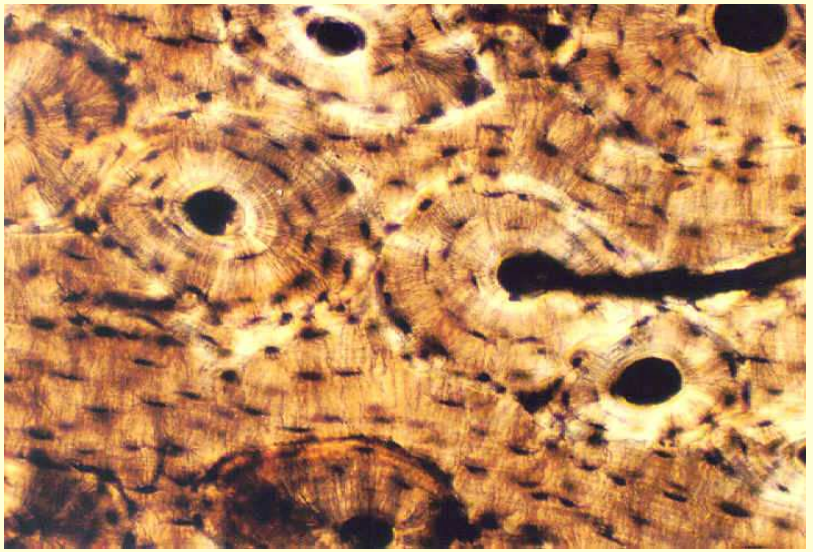
Connective Tissue

- Fibrocartilage
  - Primarily located in intervertebral disks and pubic symphysis.
    - Note how chondrocytes tend to line up.
      - Compared to a herring bone pattern.



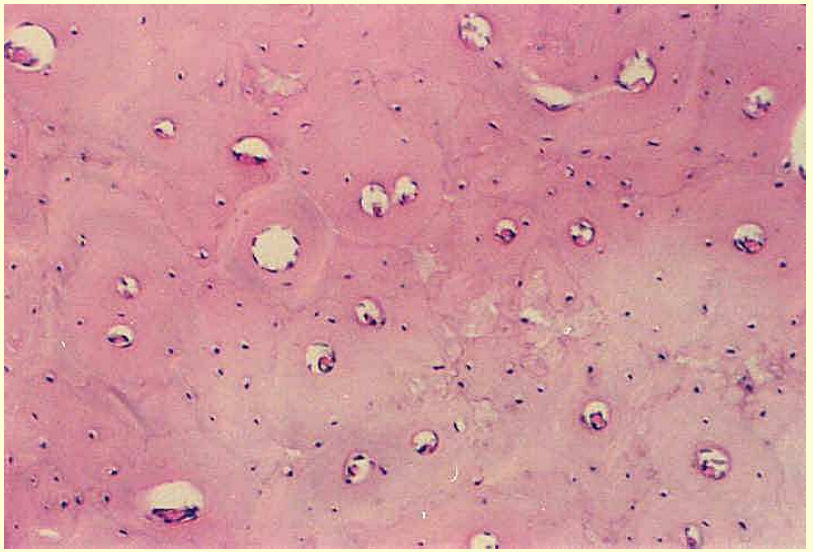
Connective Tissue

- Bone
  - This is a slide of ground/polished bone.
    - Cells of bone are called osteocytes.



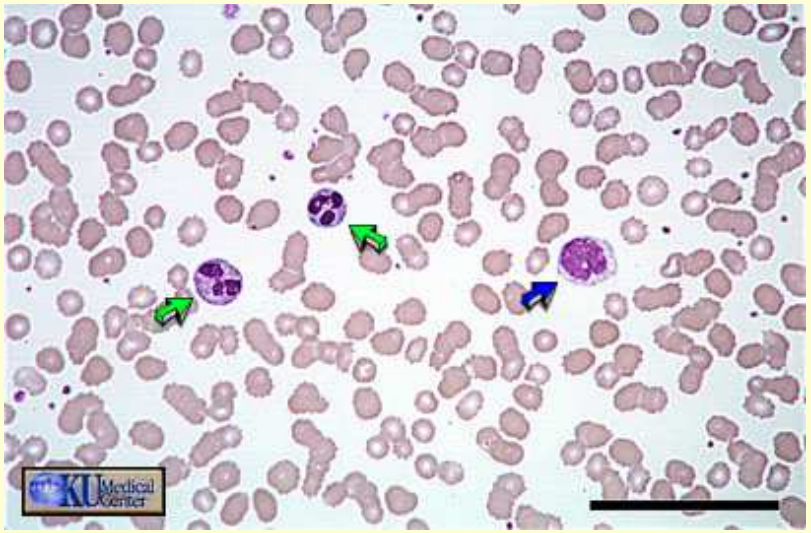
Connective Tissue

- Bone

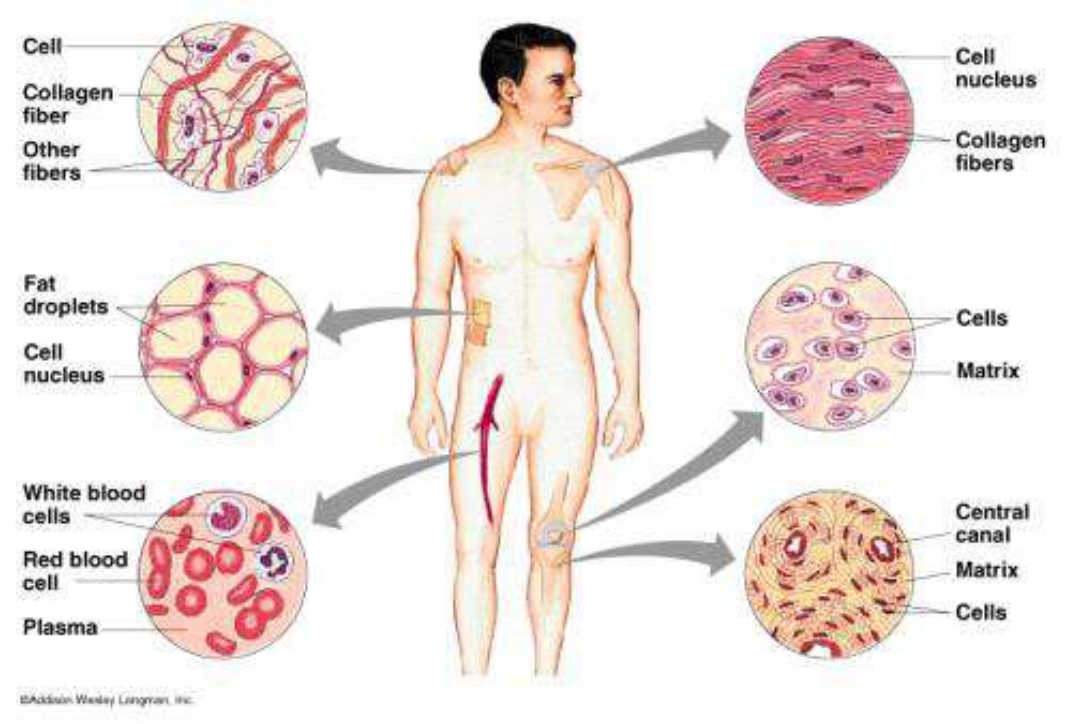


Connective Tissue

- Blood
  - Fluid connective tissue.
    - Contains leukocytes and erythrocytes
      - Green arrows point to neutrophils.
      - Blue arrow points to a monocyte.
      - Platelets and erythrocytes are also visible.

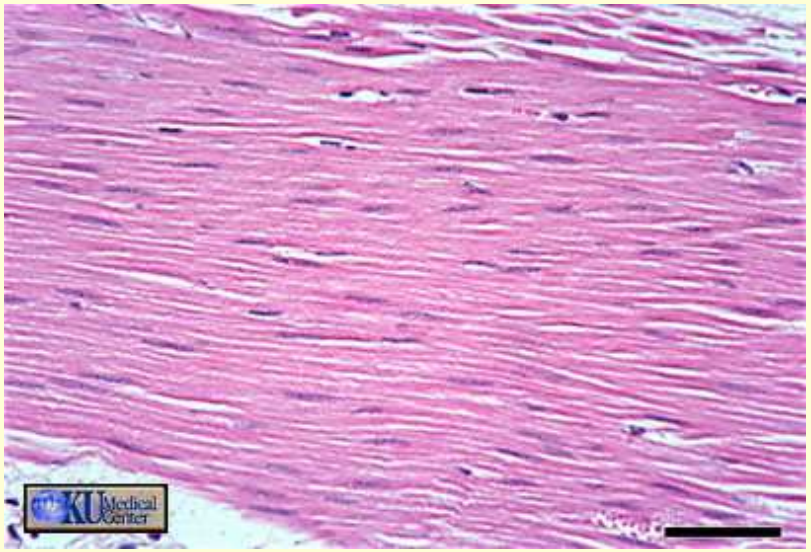


Aim: How do connective tissues differ?



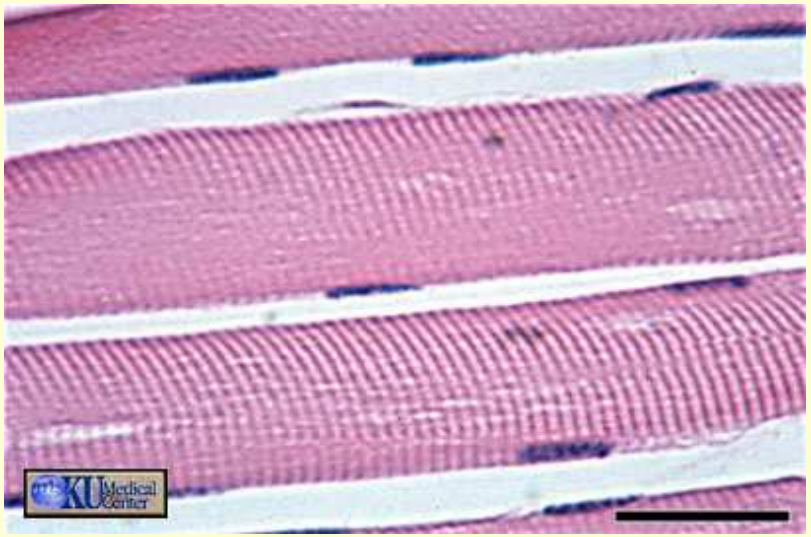
Muscle Tissue

- Smooth Muscle
  - Myocytes lack visible striations.
  - Smooth muscle is located in visceral organs.
  - Smooth muscle is involuntary muscle.



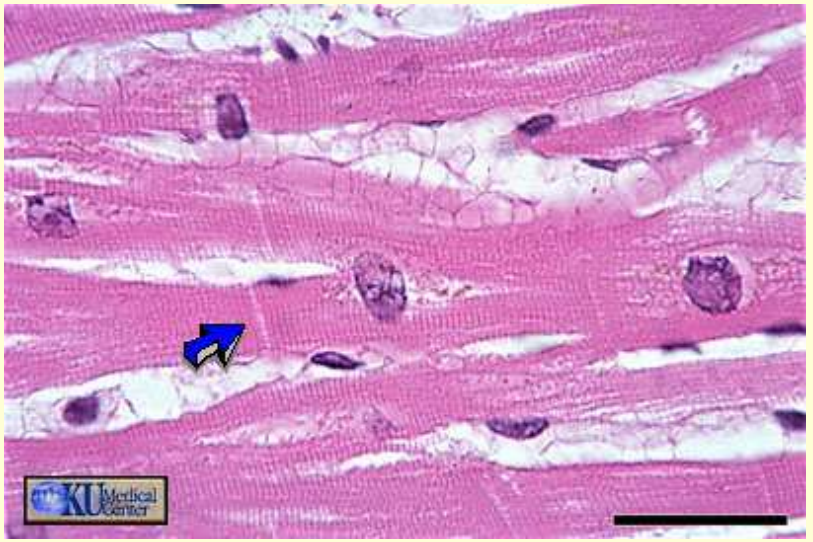
Muscle Tissue

- Skeletal Muscle
  - Myocytes are multinucleated.
  - Myocytes run entire length of muscle.
  - Myocytes are striated.
  - Skeletal muscle is voluntary muscle.



Muscle Tissue

- Cardiac Muscle
  - Myocardial cells are short and branched.
  - Myocardial cells are striated.
  - Myocardial cells are joined by intercalated disks (note arrow in picture).
  - Cardiac muscle is involuntary muscle.



General Organization