

Ch5: Body Tissues and Membranes

Tissue Types

- Tissue = groups of cells that are similar in structure and function
- Types
 - Epithelial - covering
 - Connective - support
 - Muscle - movement
 - Nervous - control

Membrane Types

○ Membranes line body cavities and hold organs together

○ Epithelial

- Cutaneous

- Function: protect underlying tissues from drying out
- Location: skin
- Structure: dry membrane

- Mucous

- Function: lubricate lining of certain body systems
- Location: systems open to outside; digestive and respiratory
- Structure: wet membrane

Membrane Types

● Epithelial

- Serous
 - Function: to prevent friction
 - Location: lines inner body cavities (pleural, pericardial, and peritoneum)
 - Structure: has an inner (visceral) layer and an outer (parietal) layer

● Connective

- Synovial
 - Function: lubricate and protect joints
 - Location: joints of body

Epithelial Tissue

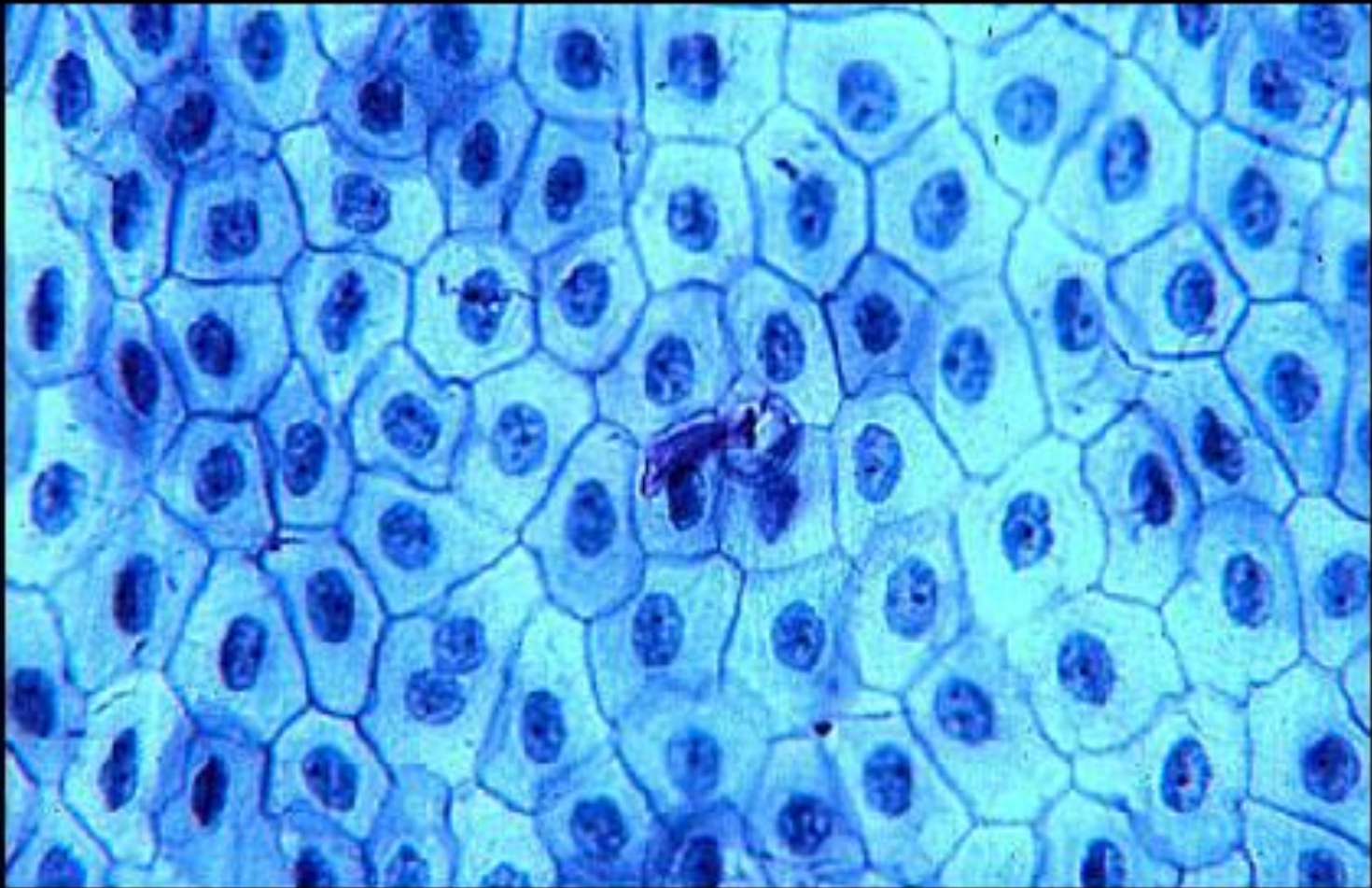
○ Function = lining, covering, and glandular tissue of the body

○ **Special Characteristics:**

- Fits closely together
- Apical surface = one free end that is exposed to body's exterior
- Lower surface rests on basement membrane (connective)
- No blood supply of their own and depend on diffusion
- Regeneration

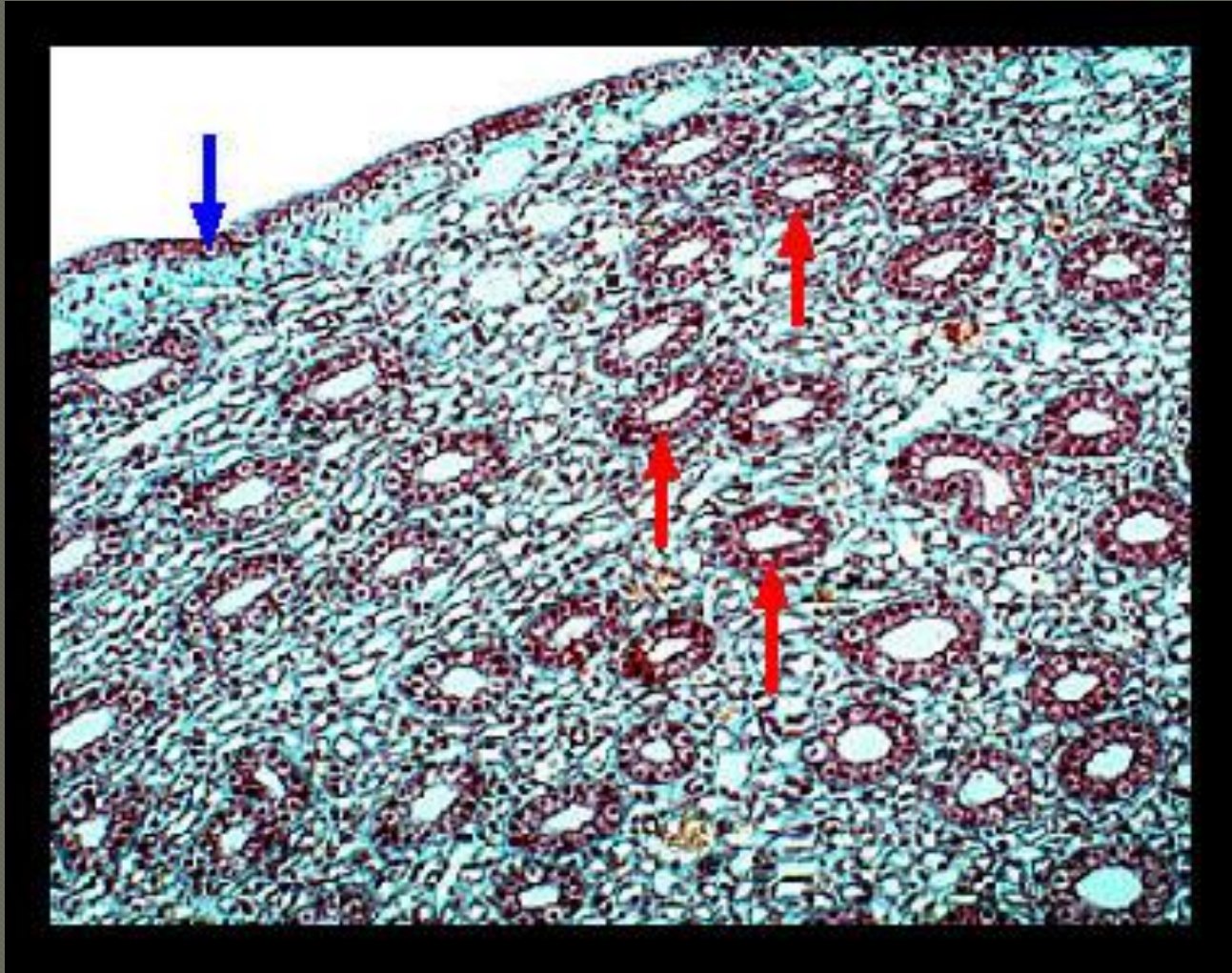
Epithelial Tissue: Classification

- Simple = one layer, absorption, secretion, filtration
- Types
 - Simple Squamous – (serous membrane) forms where filtration and rapid diffusion takes place
 - Ex: air sacs in lungs or lining of ventral body cavity
 - Simple Cuboidal – found in glands and their ducts
 - Ex: salivary gland and pancreas



- Lines areas that need rapid diffusion of material
- Ex) lungs

- Lines ducts and glands
- Ex) ovaries, kidneys



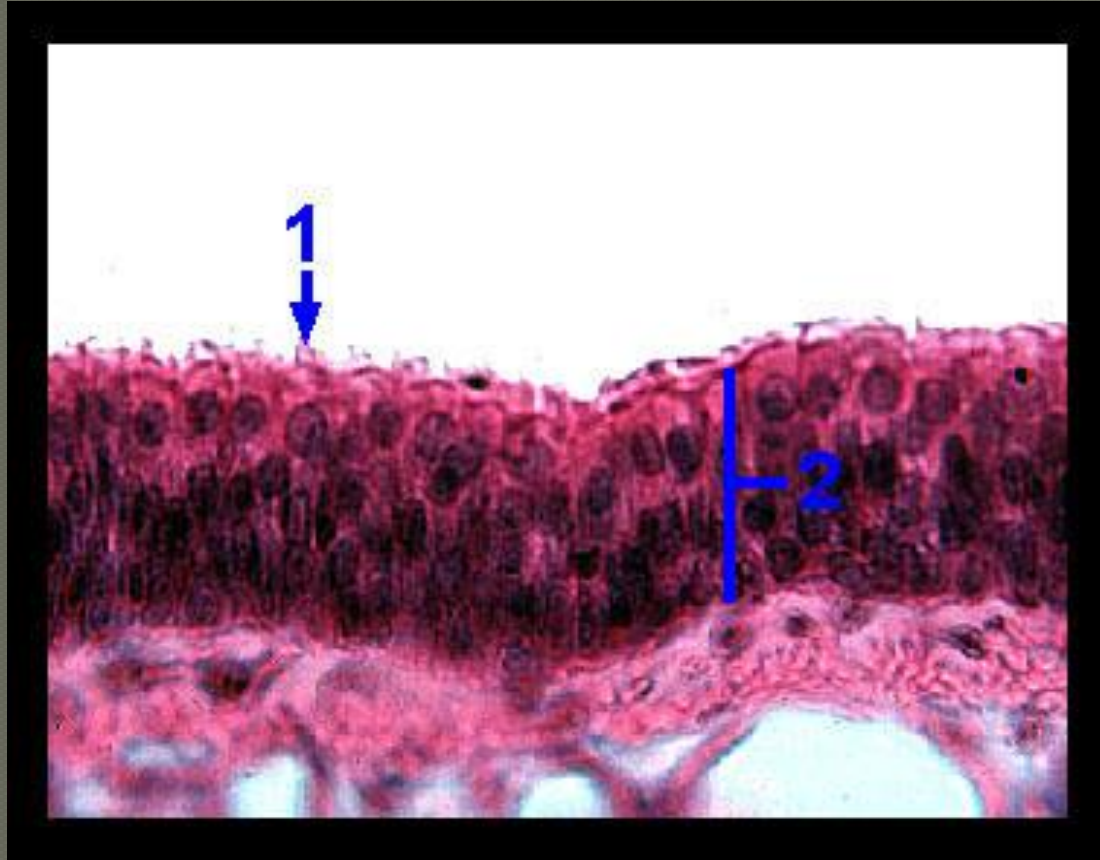
Epithelial Tissue: Classification

- Simple Columnar – (mucous membranes)
goblet cells secrete mucous
 - Ex: lining of digestive tract (intestines)
- Pseudostratified Columnar – give false impression of layers
 - Ex: lining of respiratory tract - ciliated

- Lines digestive tract
- Ex) small and large intestines

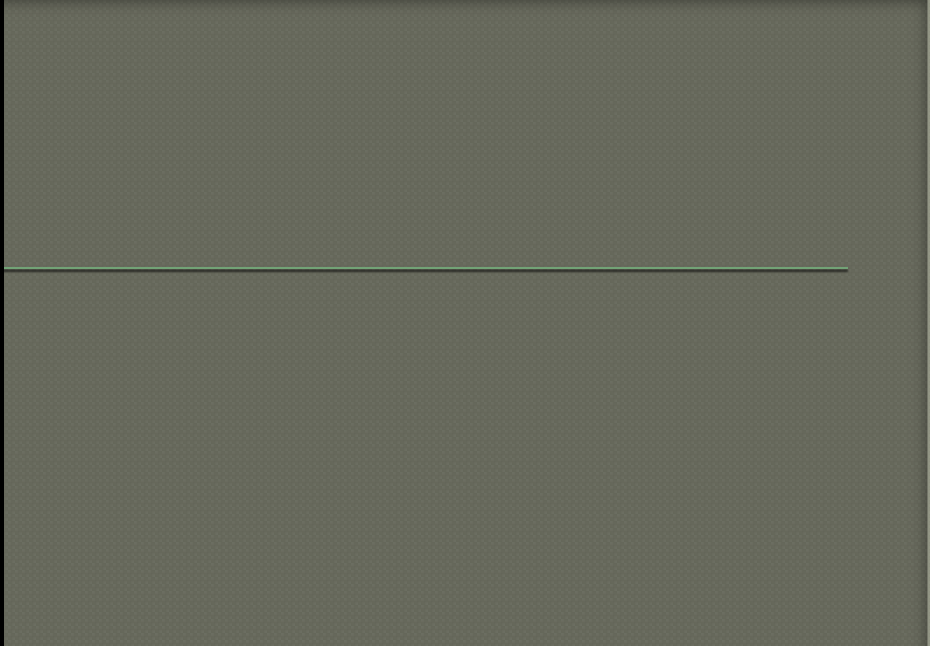
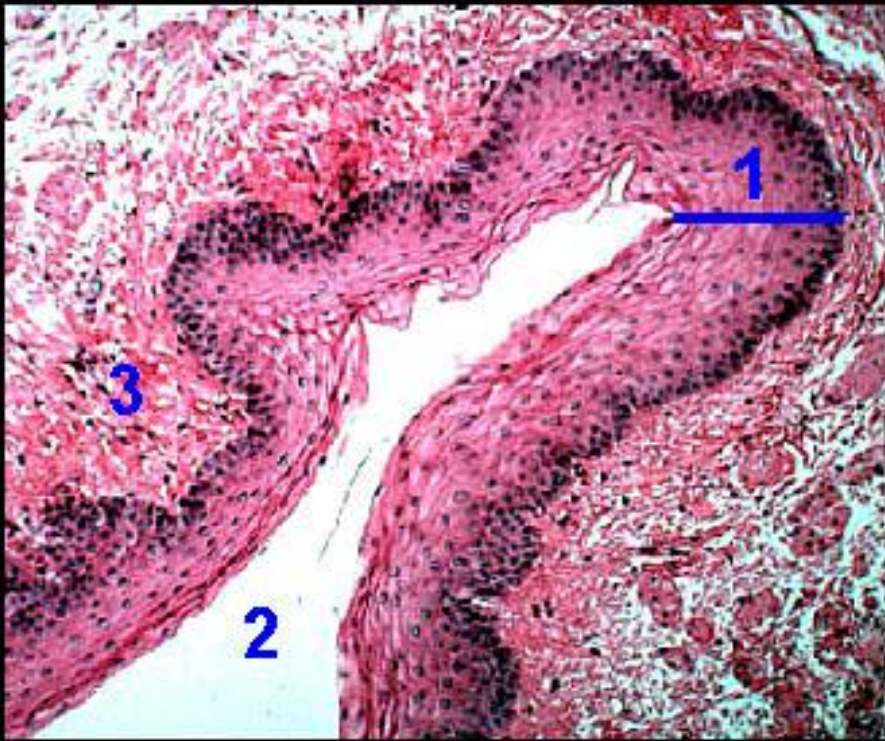


- ① Lines respiratory tract and contains cilia



Epithelial Tissue: Classification

- ◉ Stratified = more than one layer, more durable, protection
- ◉ Types:
 - Stratified Squamous – found in mouth, esophagus, and skin
 - Found in places that require some protection against objects (clothes/food)



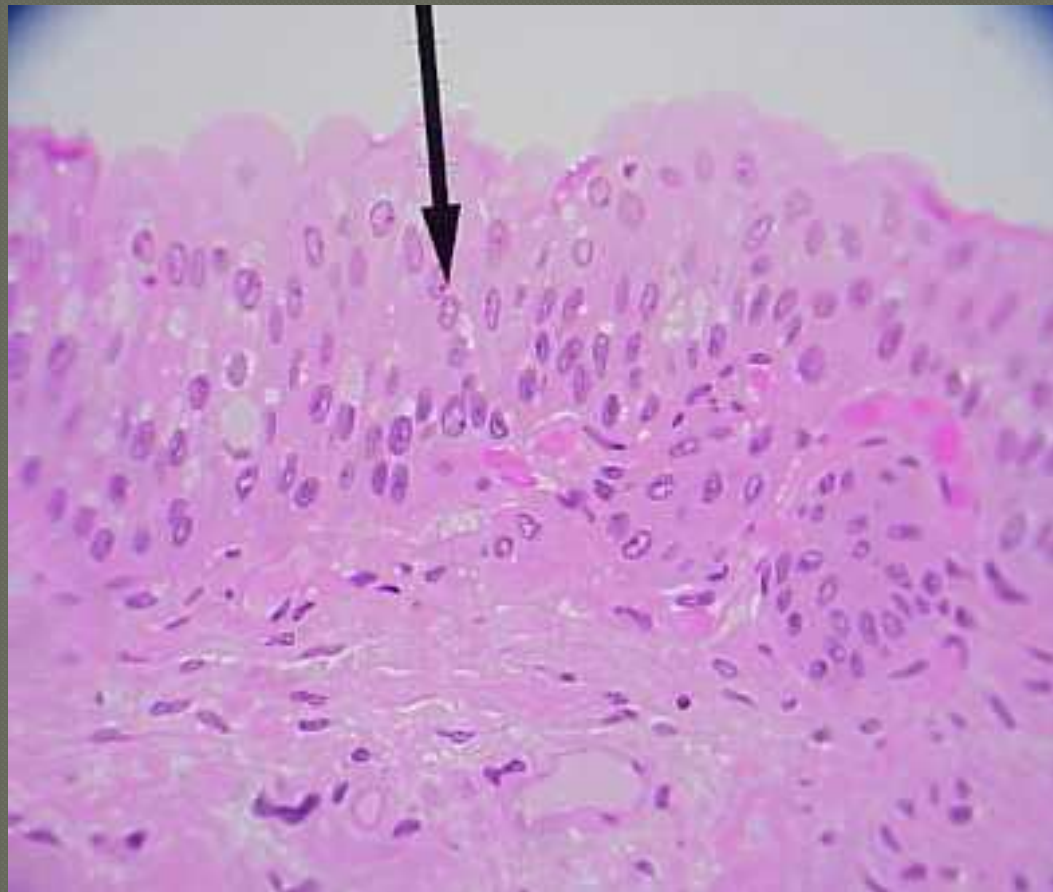
● Lines mouth and esophagus



Epithelial Tissue: Classification

- Stratified Cuboidal and Columnar – fairly rare
 - found in ducts of large glands
- Transitional – lines bladder, ureters, and urethra
 - changes shape when stretched

- Changes shape and lines the bladder and urethra



Epithelial Tissue: Classification

- Glandular – consists of one or more cells that make and secrete a product
- Types:
 - Endocrine glands – secrete hormones (thyroid, adrenals, pituitary)
 - Exocrine glands – have ducts to outside (sweat, oil glands)

Connective Tissue

- Function = protecting, supporting, and binding together other body tissues
- Common Characteristics
 - Variations in blood supply
 - Most are well vascularized, but tendons and ligaments are not
 - Cartilage is avascular – heals very slowly or not at all

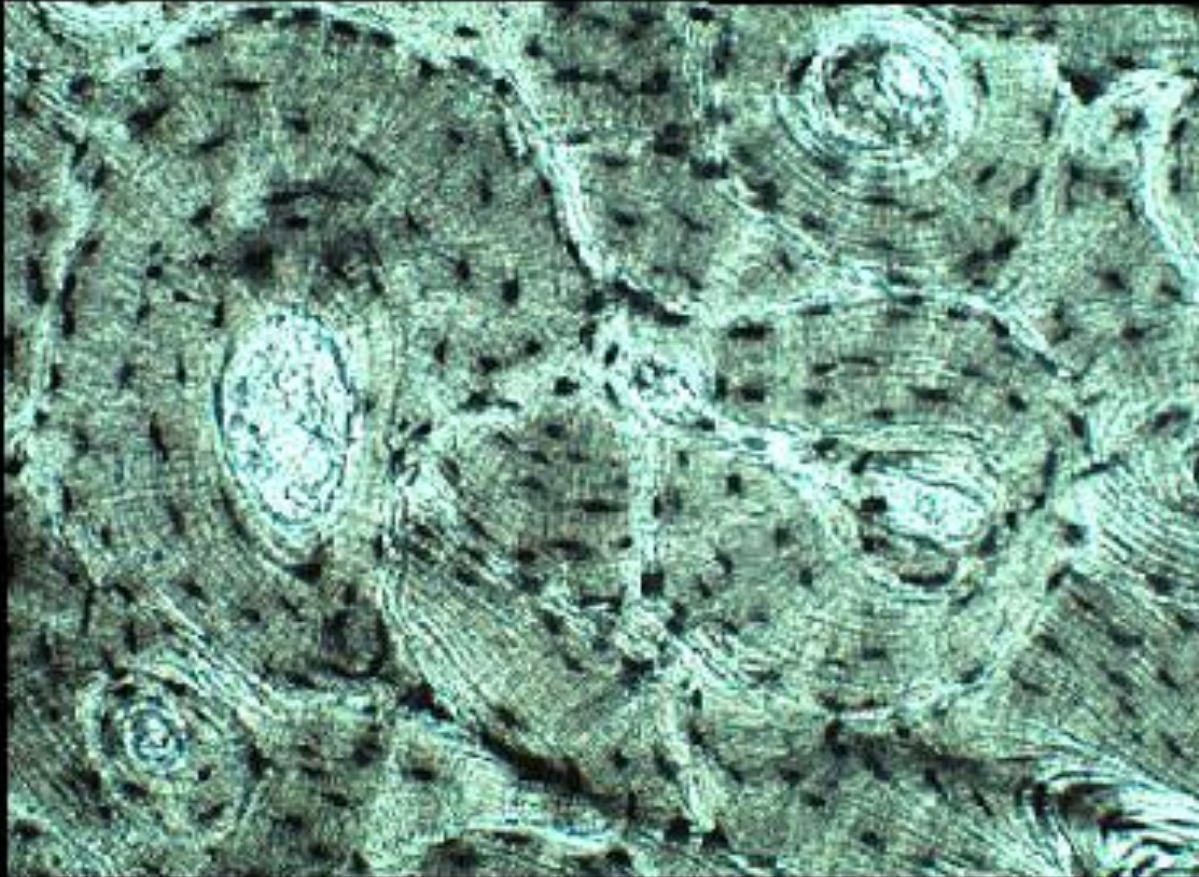
Connective Tissue

○ Common Characteristics

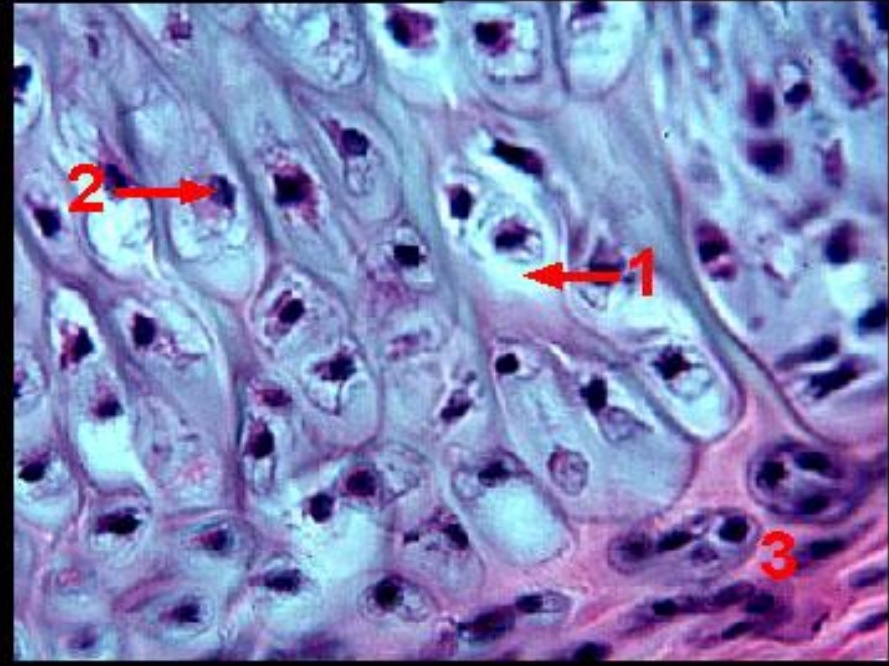
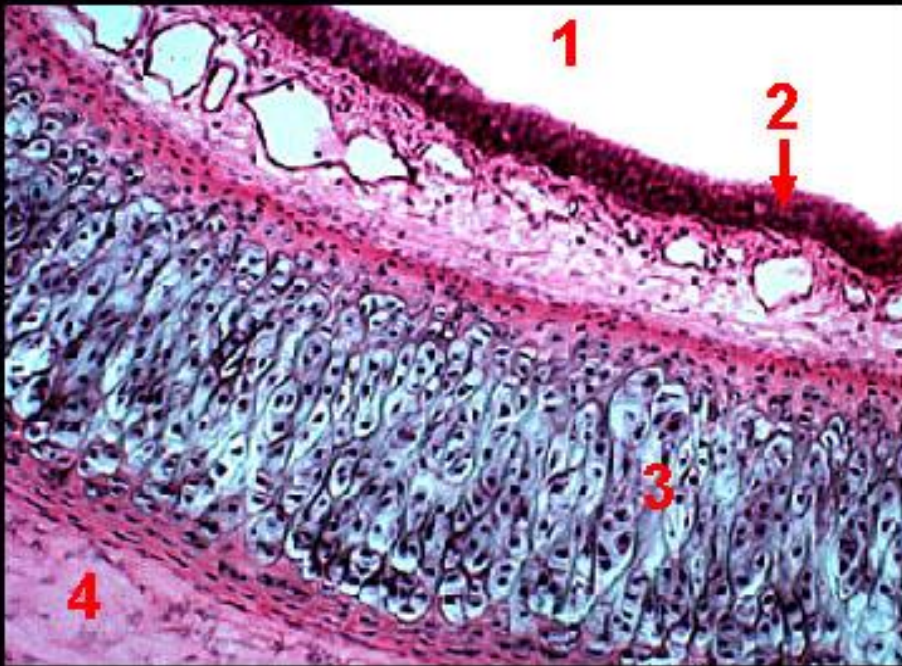
- Extracellular matrix – contains different types of cells surrounded by nonliving substances
 - Connective tissue makes it – different thicknesses
 - Allows tissue to bear weight or withstand stretching
 - Varies from hard (bone) to soft (fat)
- Types of fibers made by connective tissue
 - Collagen – white
 - Elastic – yellow
 - Reticular – fine collagen

Connective Tissue: Classification

- Bone (osseous) – bone cells sitting in lacunae and surrounded by very hard matrix
 - Protects and supports other body organs
- Cartilage – softer and more flexible than bone
 - Hyaline – collagen fibers in rubbery matrix and glassy appearance
 - Larynx, attaches ribs to breastbone, covers ends of bones at joints, makes up fetus skeleton
 - Elastic – found where structures need elasticity
 - External ear, vertebral discs

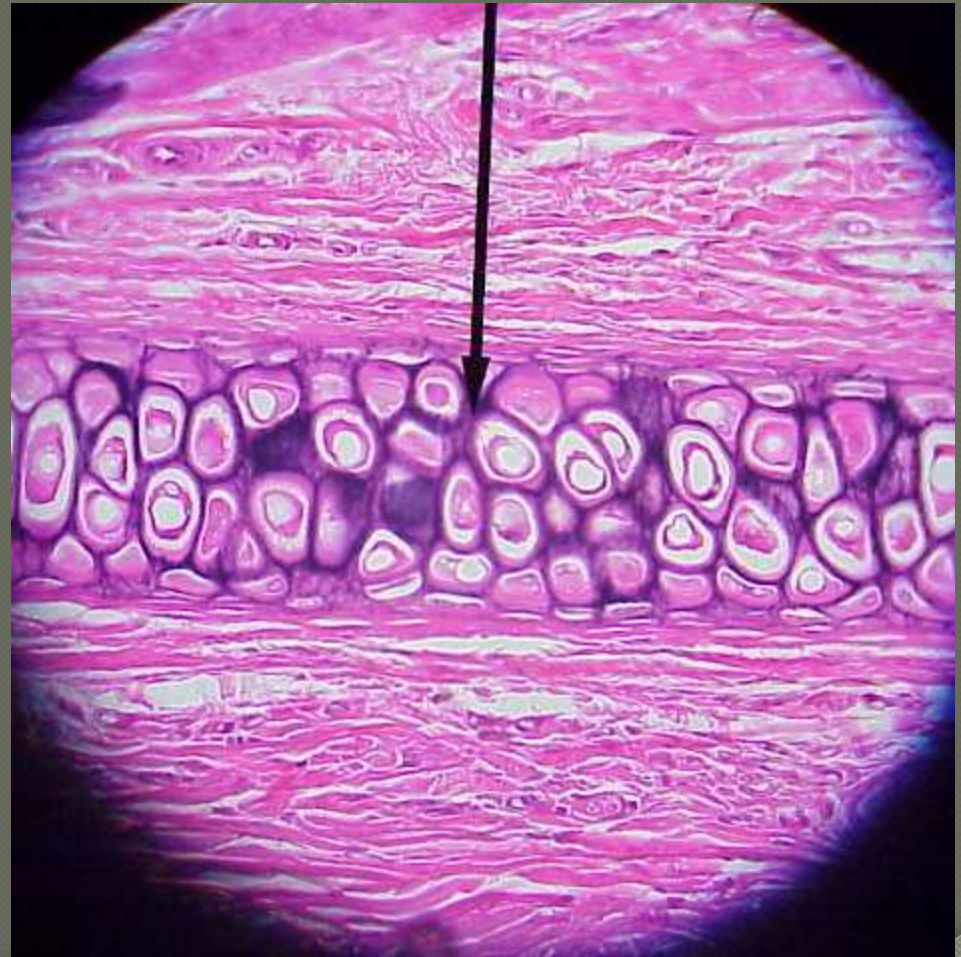


- Very hard and provides attachments for muscles



- Makes up the larynx and connects ribs to sternum
- Fetal skeletal made up of this type of tissue

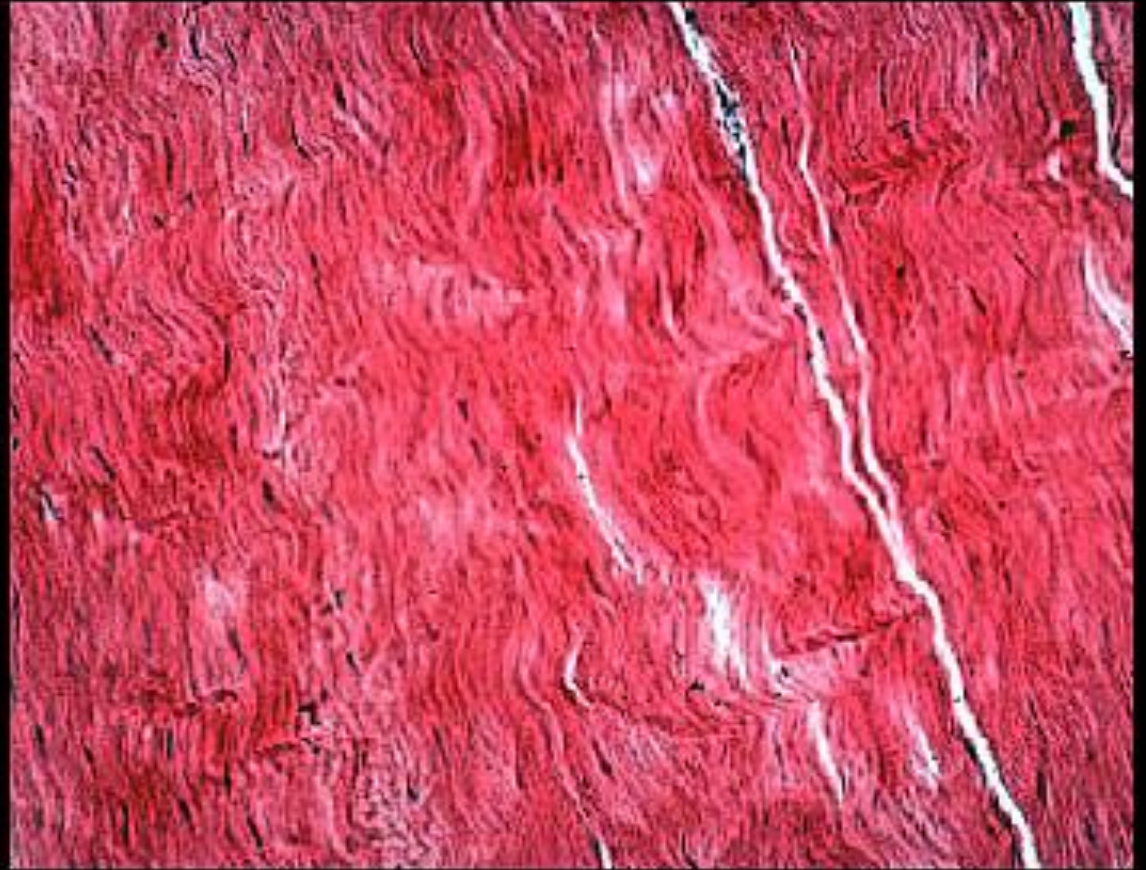
- Makes up our external ear and vertebral disks



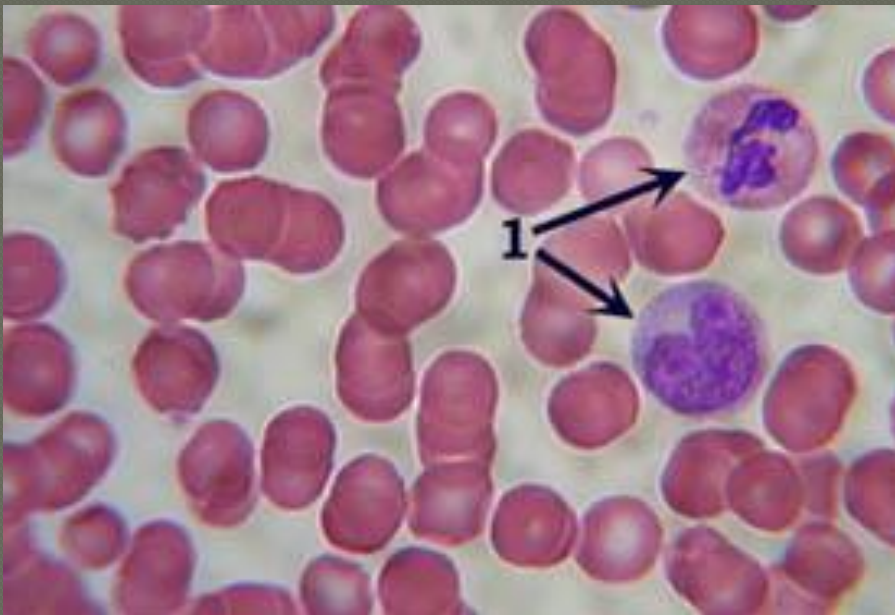
Connective Tissue: Classification

- **Dense Connective Tissue – contain collagen and fibroblasts (fiber-forming cells)**
 - Tendons = connects muscle to bone
 - Ligaments = connects bone to bone
- **Blood – only fluid tissue**
 - Blood cells surrounded by nonliving fluid matrix called plasma
 - Transport vehicle of cardiovascular system

- Connects muscle to bone and bone to bone



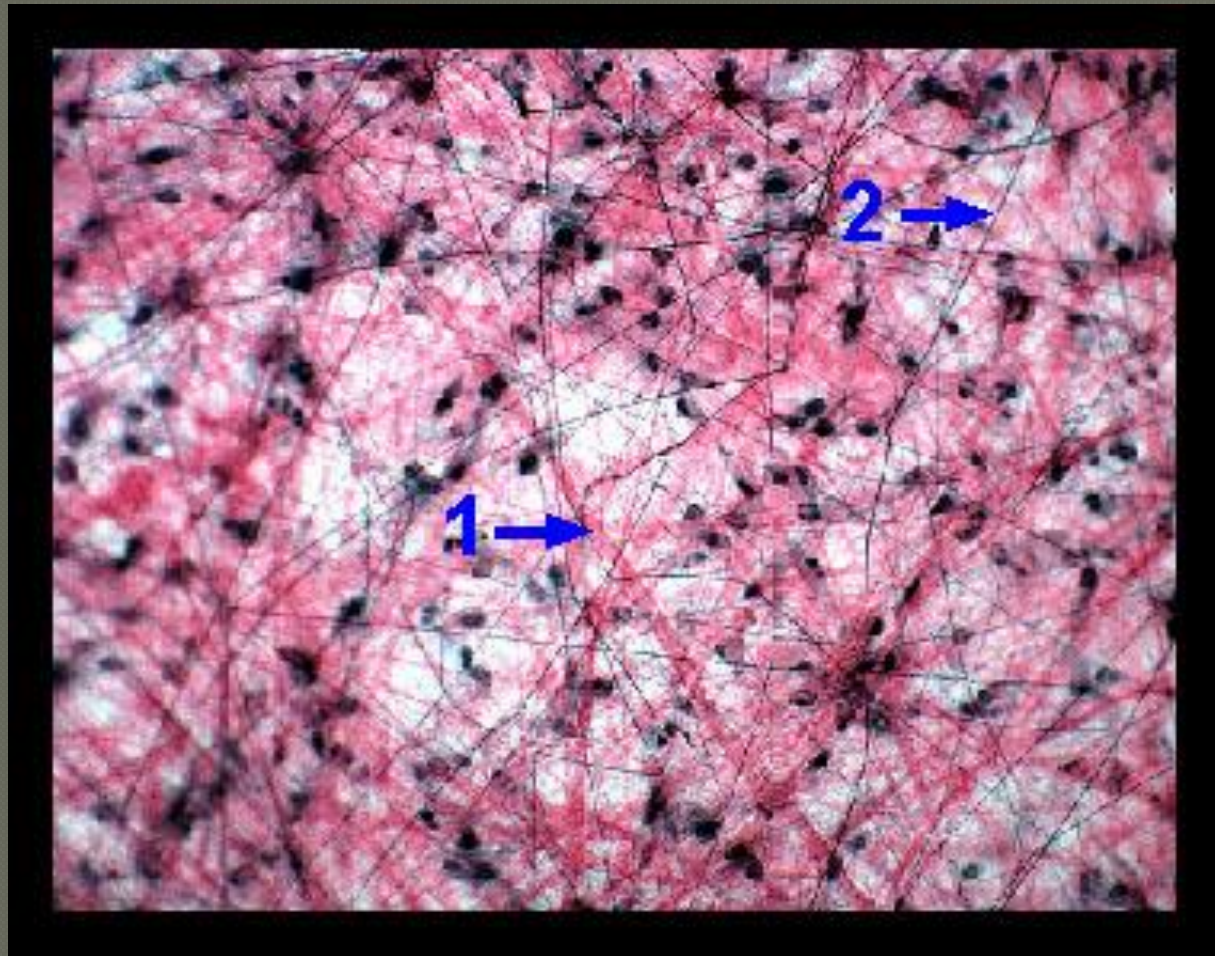
- Also considered vascular tissue
- Found in plasma



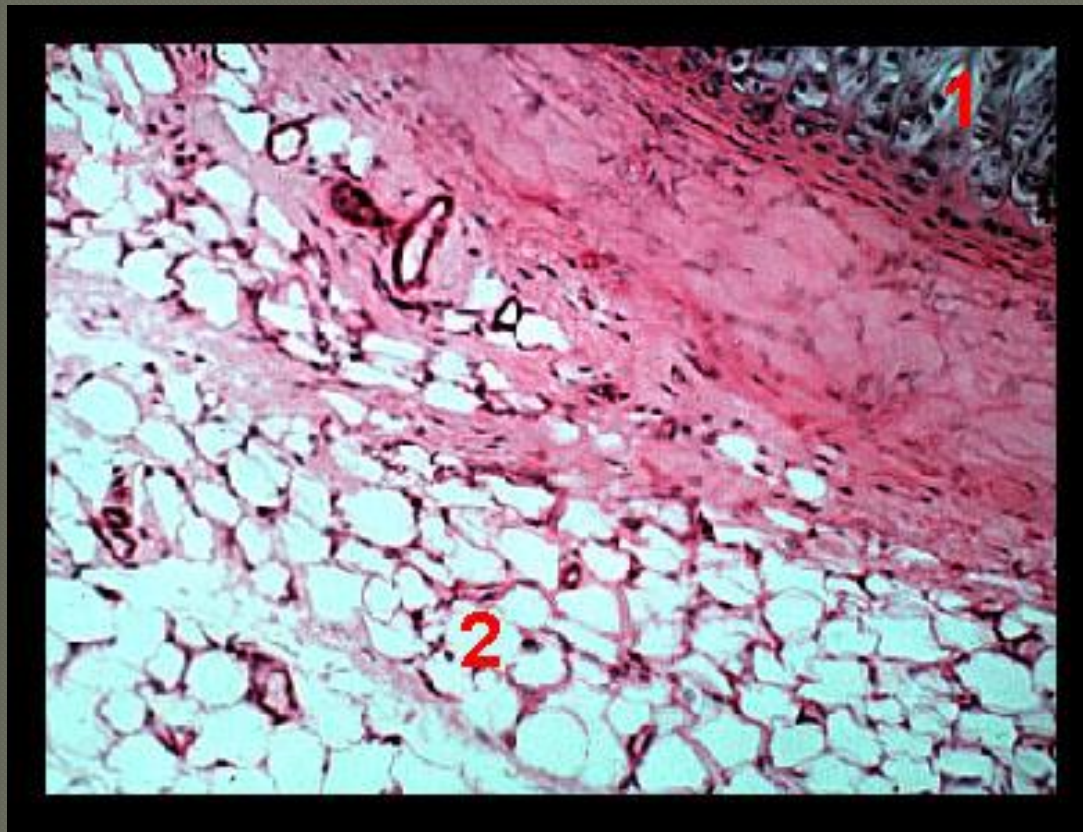
Connective Tissue: Classification

- **Loose Connective Tissue – soft, more cells, and fewer fibers**
 - **Areolar – holds internal organs together**
 - Provides a reservoir of water and salts for surrounding tissues
 - Edema – when body region gets inflamed and areolar tissue soaks up excess fluid
 - **Adipose (fat) – stored oil that insulates and cushions body parts**
 - **Reticular – form stroma**
 - internal supporting framework for lymphoid organs (spleen and lymph nodes)

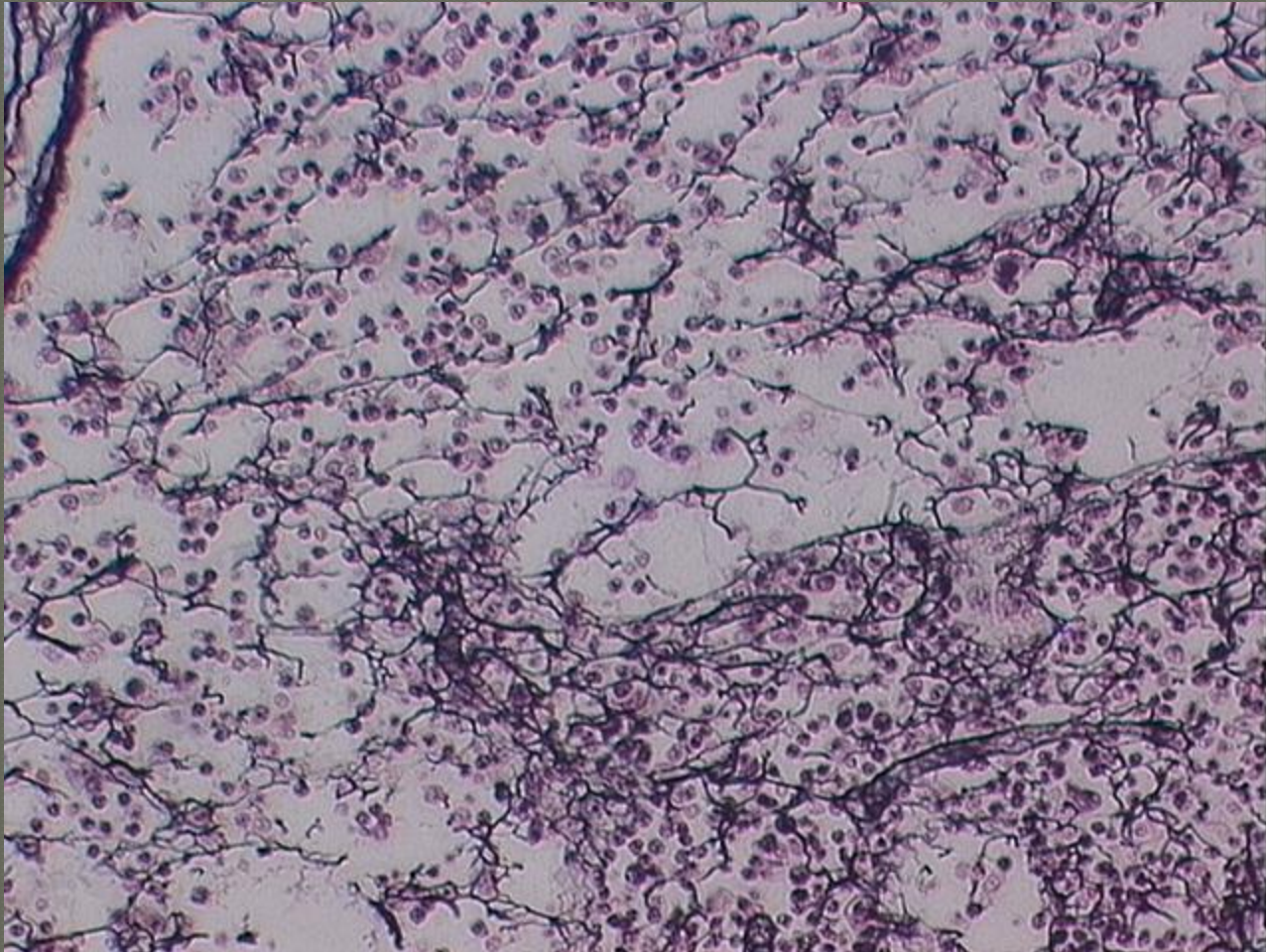
- Used to bind or fasten down tissues such as skin, membranes, nerves, and muscles



- Used for cushioning, protection, and insulation
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- Gives support to lymphoid organs (spleen, bone marrow and lymph nodes)



Muscle Tissue

- ◉ Function = aids in the internal and external movement of the body
- ◉ Types: Skeletal, cardiac, and smooth
- ◉ Characteristics: striations, control, location, and number of nuclei

Muscle Tissue: Classification

○ Skeletal

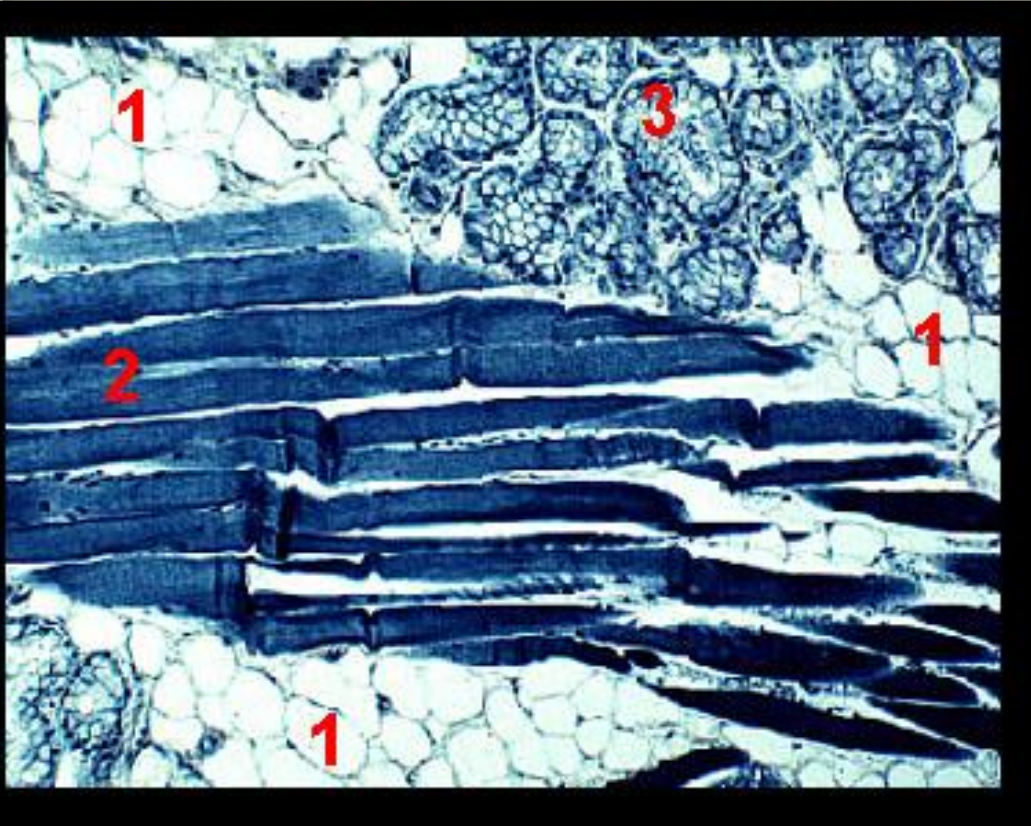
a. Location: Attached to skeleton; moves body

b. Control: Voluntary

c. Striated – has visible stripes in cell

Multinucleated – formed because cells fuse during development to form one long cell

Long and cylindrical



- #2 – provides movements of body parts

Muscle Tissue: Classification

- Cardiac

- a. Location: only in heart

- b. Striated

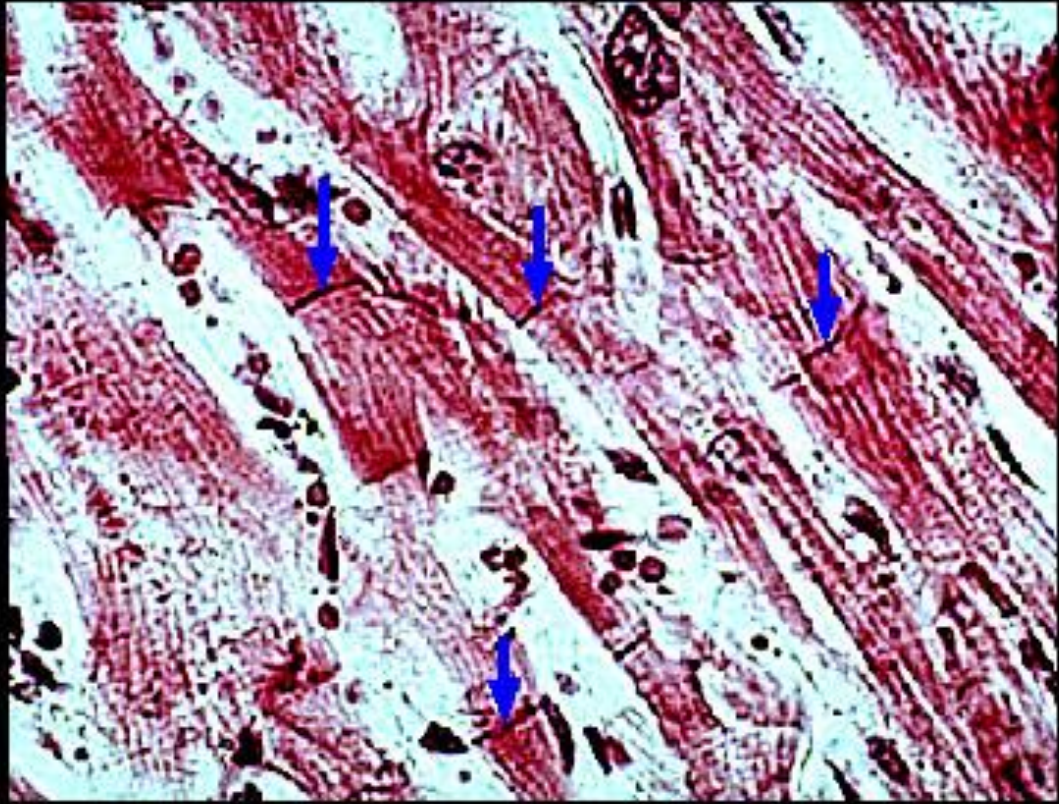
- c. One nucleus

- Fits tightly together at junctions called intercalated disks

- d. Gap junctions that allow ions to pass freely from cell to cell to cause rapid conduction of electrical impulses

- e. Control: Involuntary

○ Found only in the heart



Muscle Tissue: Classification

- Smooth

- a. No striations

- Control: Involuntary

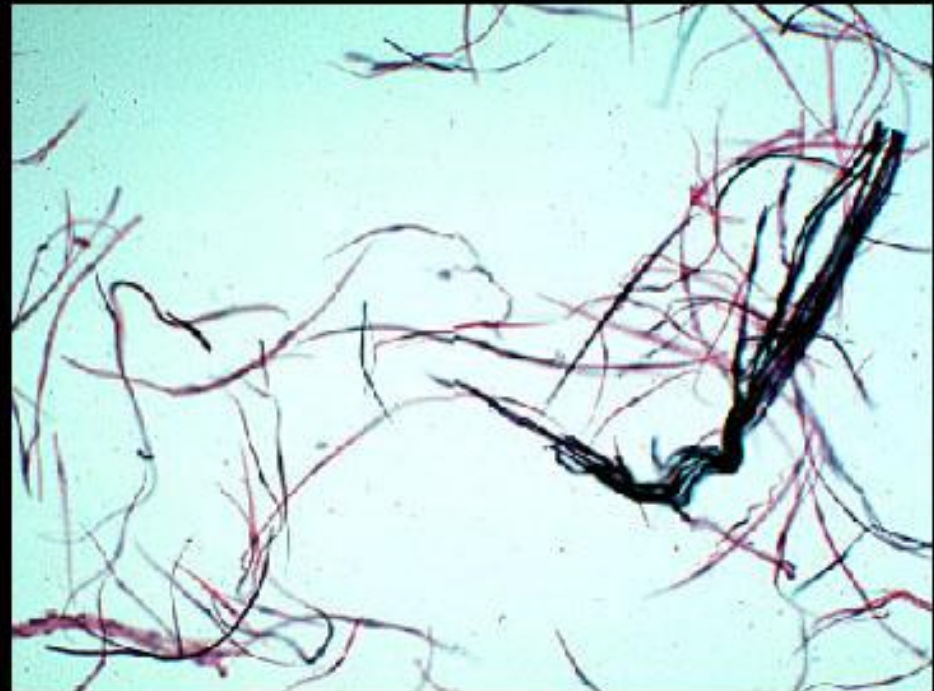
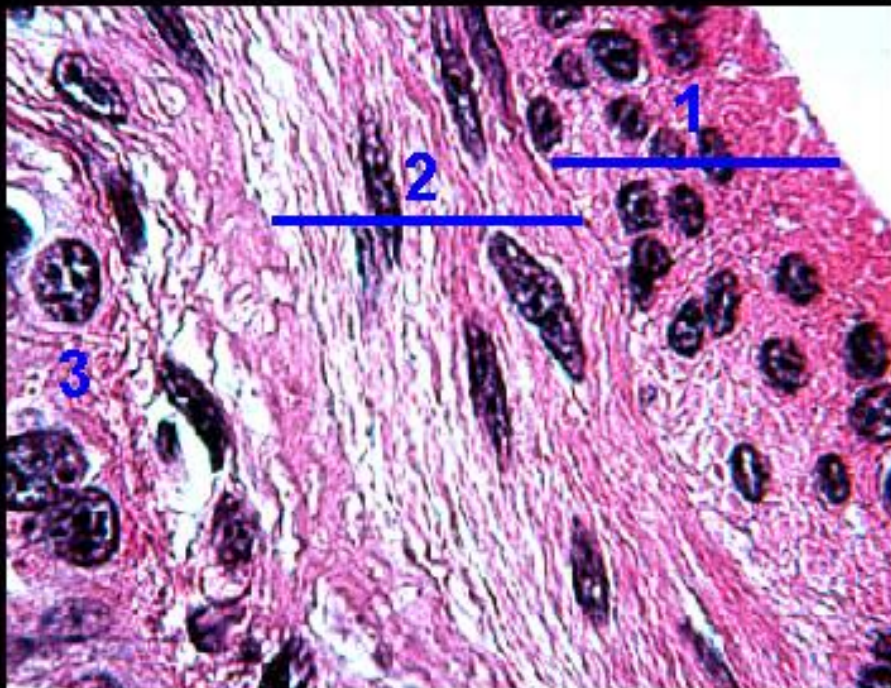
- b. Spindle-shaped

- One nucleus

- c. Location: walls of hollow organs (stomach, bladder, uterus, blood vessels)

- d. Creates peristalsis = wavelike motion of the slow contraction

- Contracts by peristalsis
- Provides movement in digestive system and blood vessels



Nervous Tissue

- Neurons = nerve cells that receive and conduct electrochemical impulses from one part of the body to another
- Characteristics
 - Irritability and conductivity
- Structure
 - Cytoplasm in long extensions (axon) with supporting cells around them for support and nutrients

- Conducts electrical signal and controls movements and other functions in the body

