Chapter 4 - Tissues

Epithelial

Covers surfaces of the body or forms glands

Connective

Joins cells and other tissue, forms a supporting framework, and transports substances

Muscle

Contracts to produce motion.

Nervous

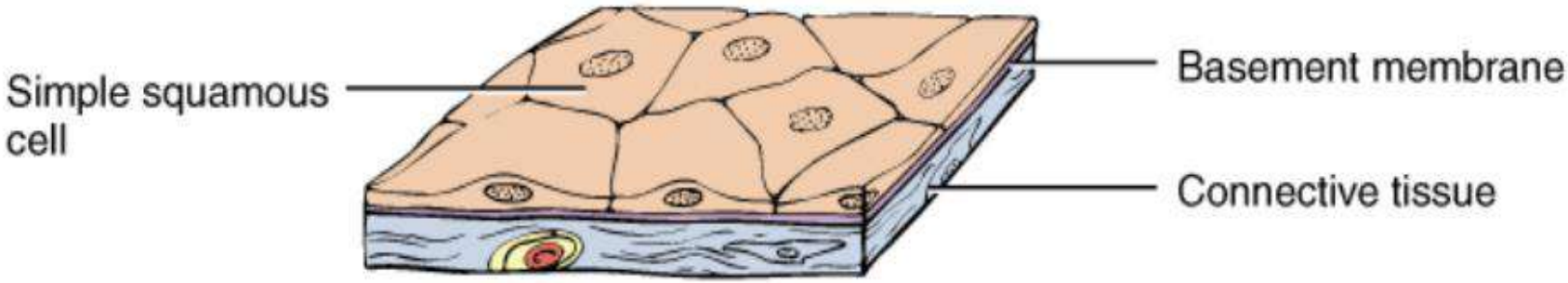
Transmits electrochemical impulses, coordinates and controls many body activities, reacts or responds to stimuli.

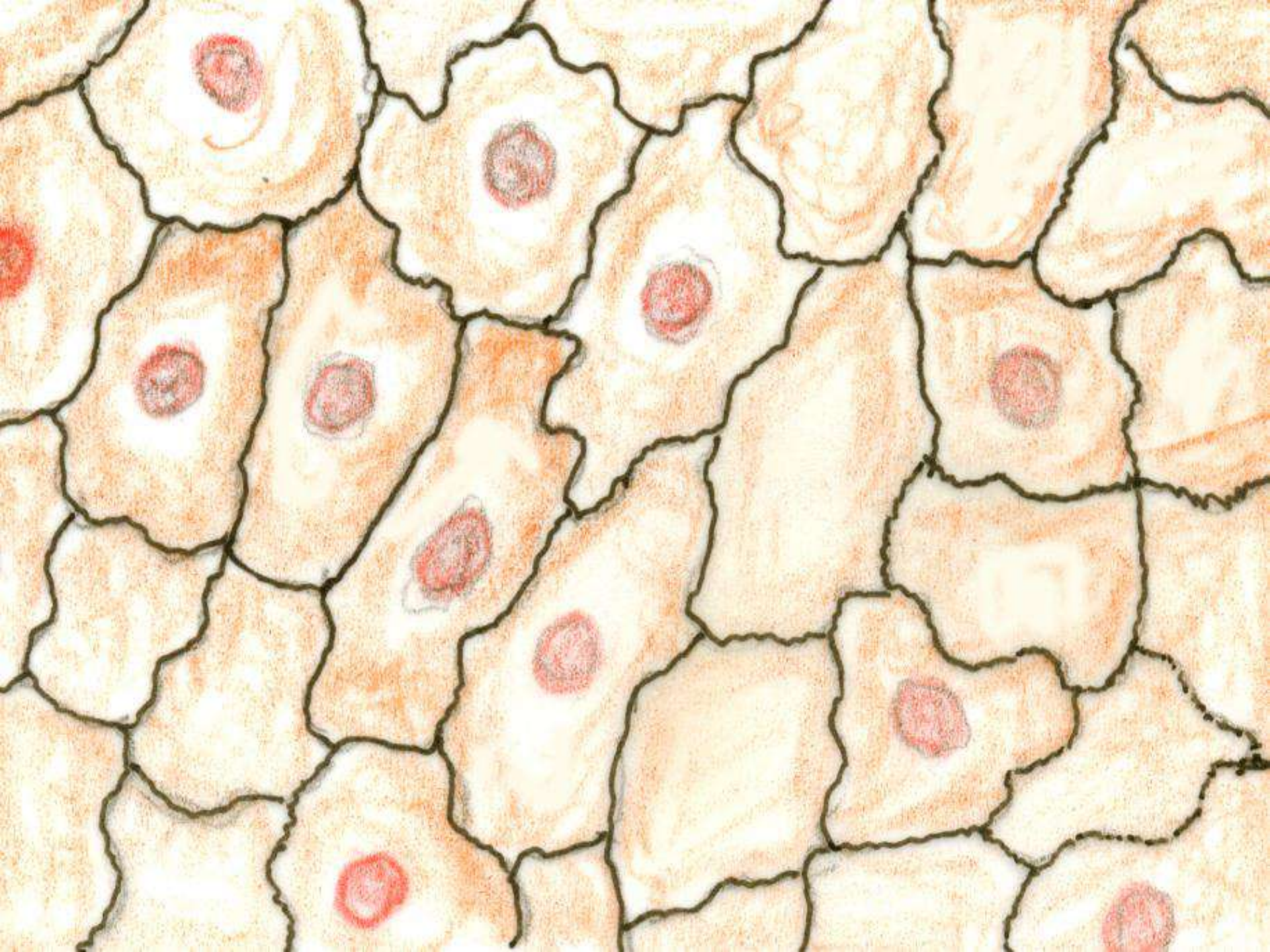
Types of Epithelium:

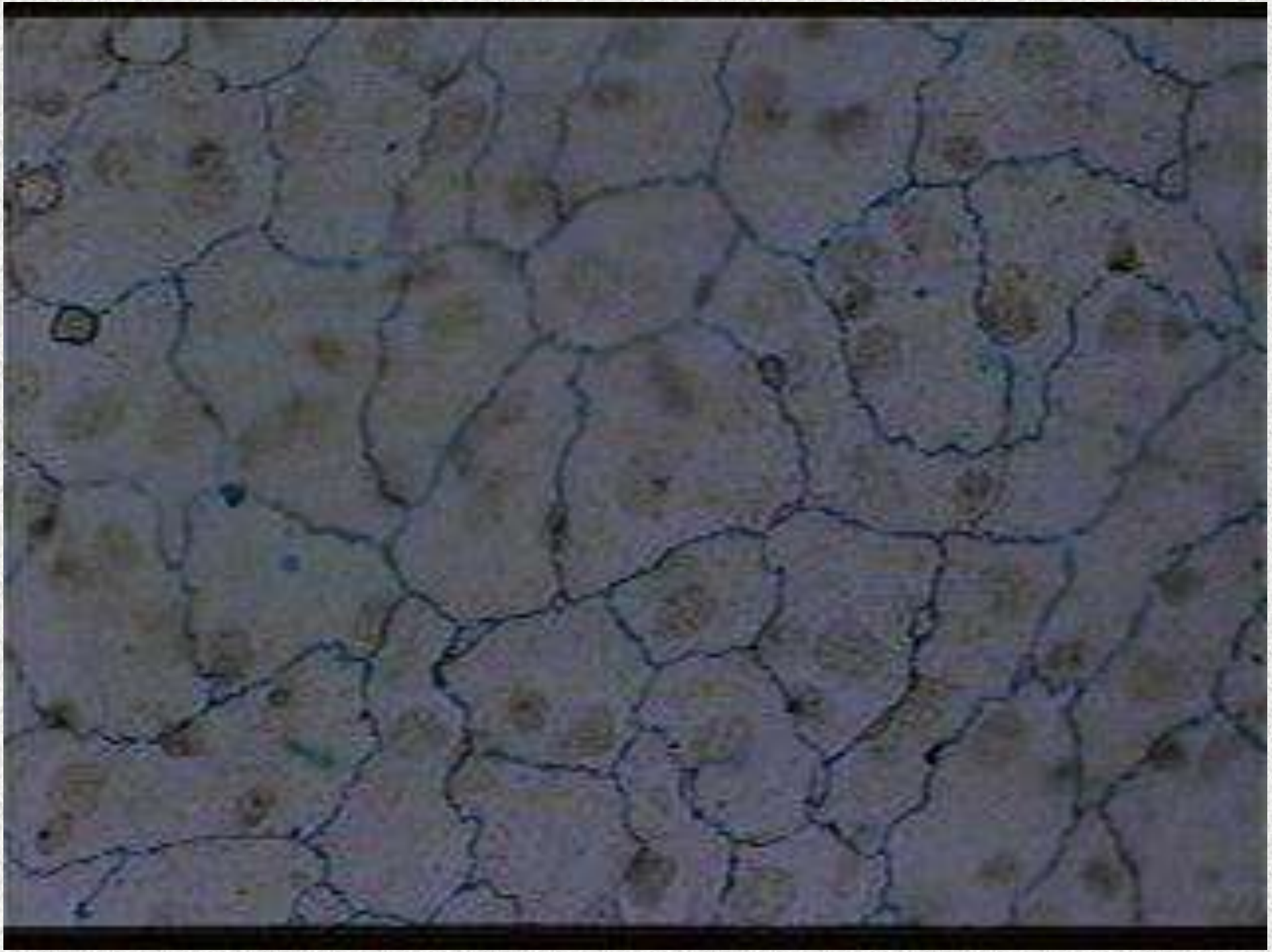
Simple epithelium- one layer of cells

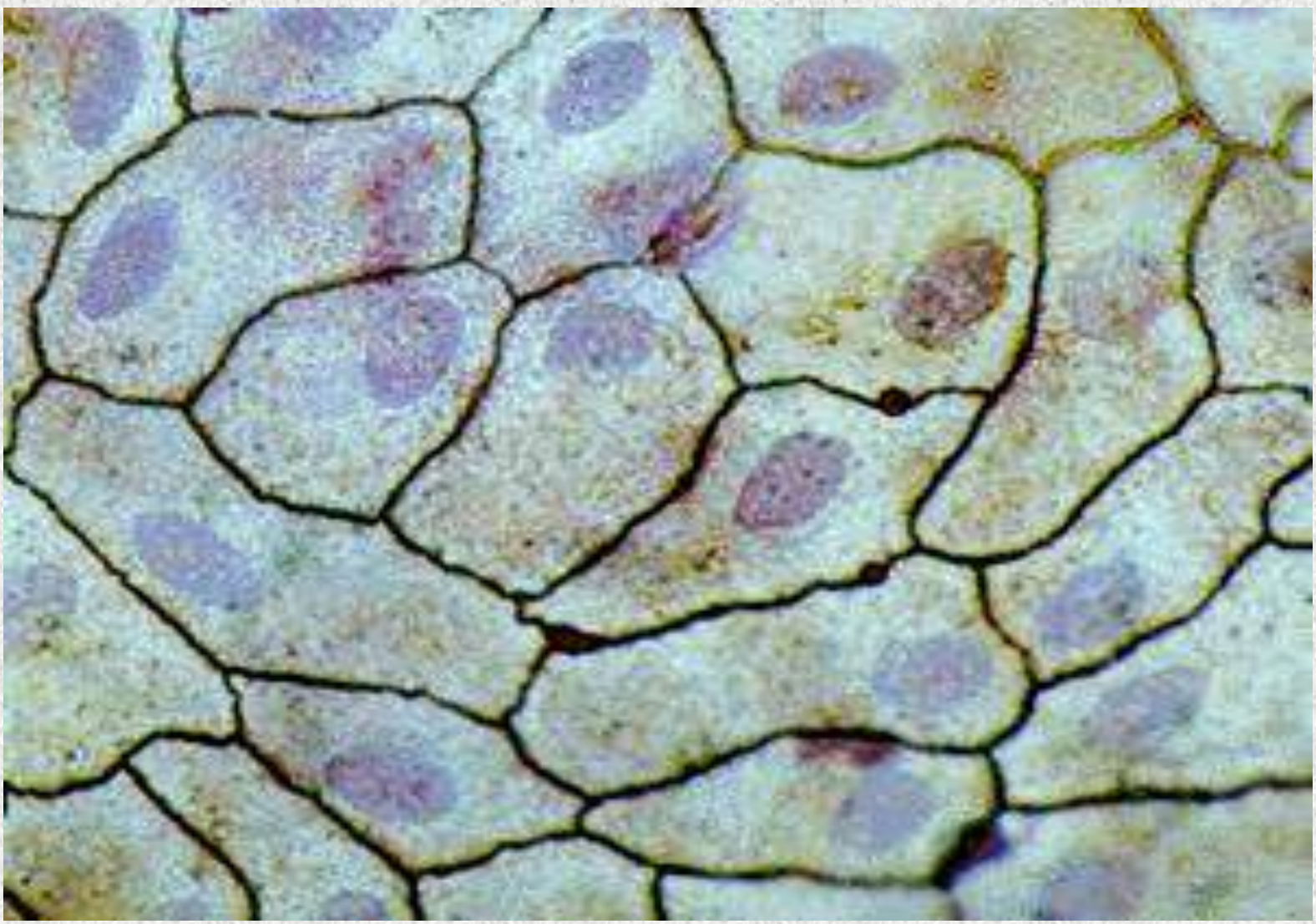
Squamous- flattened, thin: diffusion, protection, filtration: lungs, parts of circulatory system.

Simple Squamous Epithelium

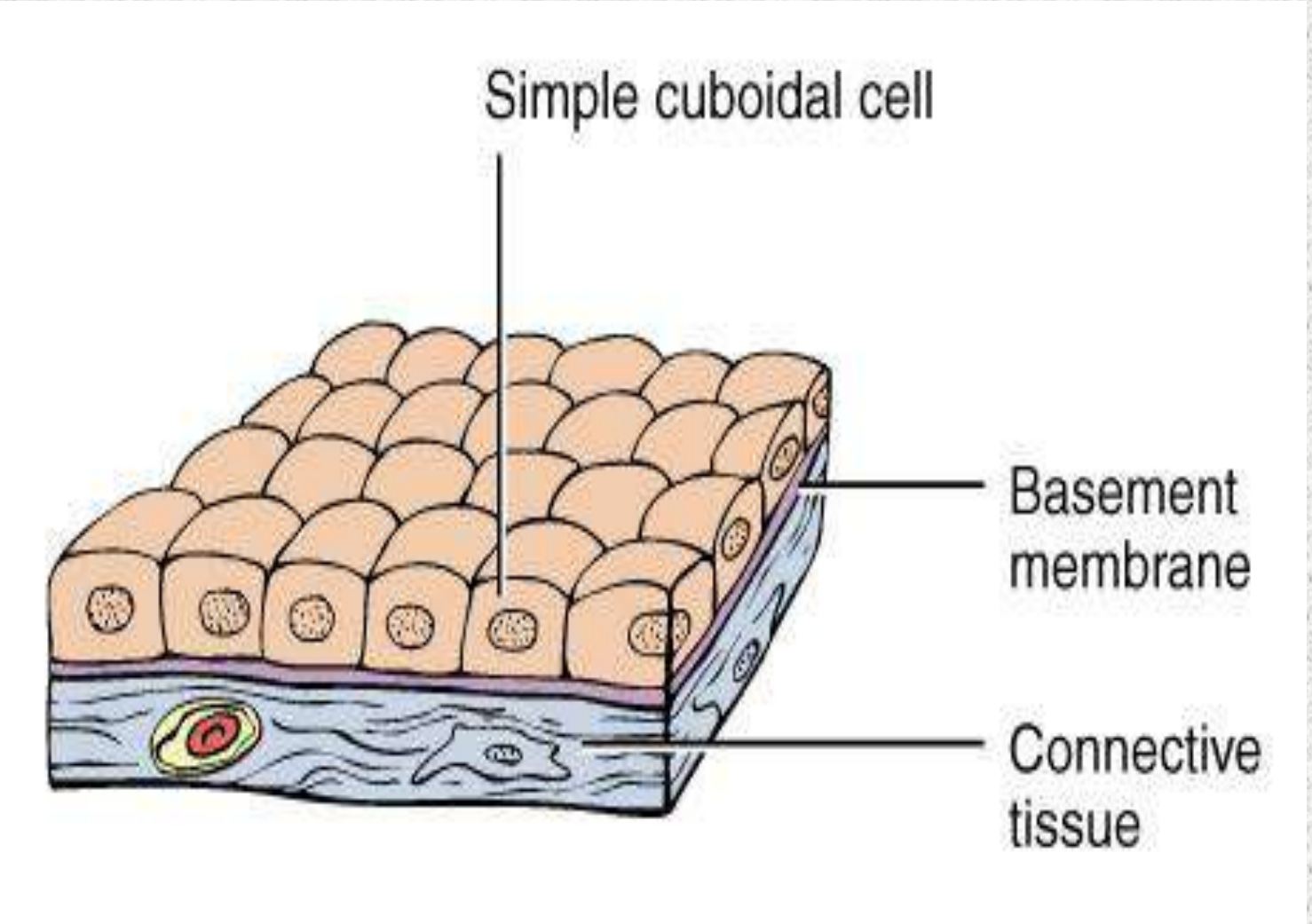


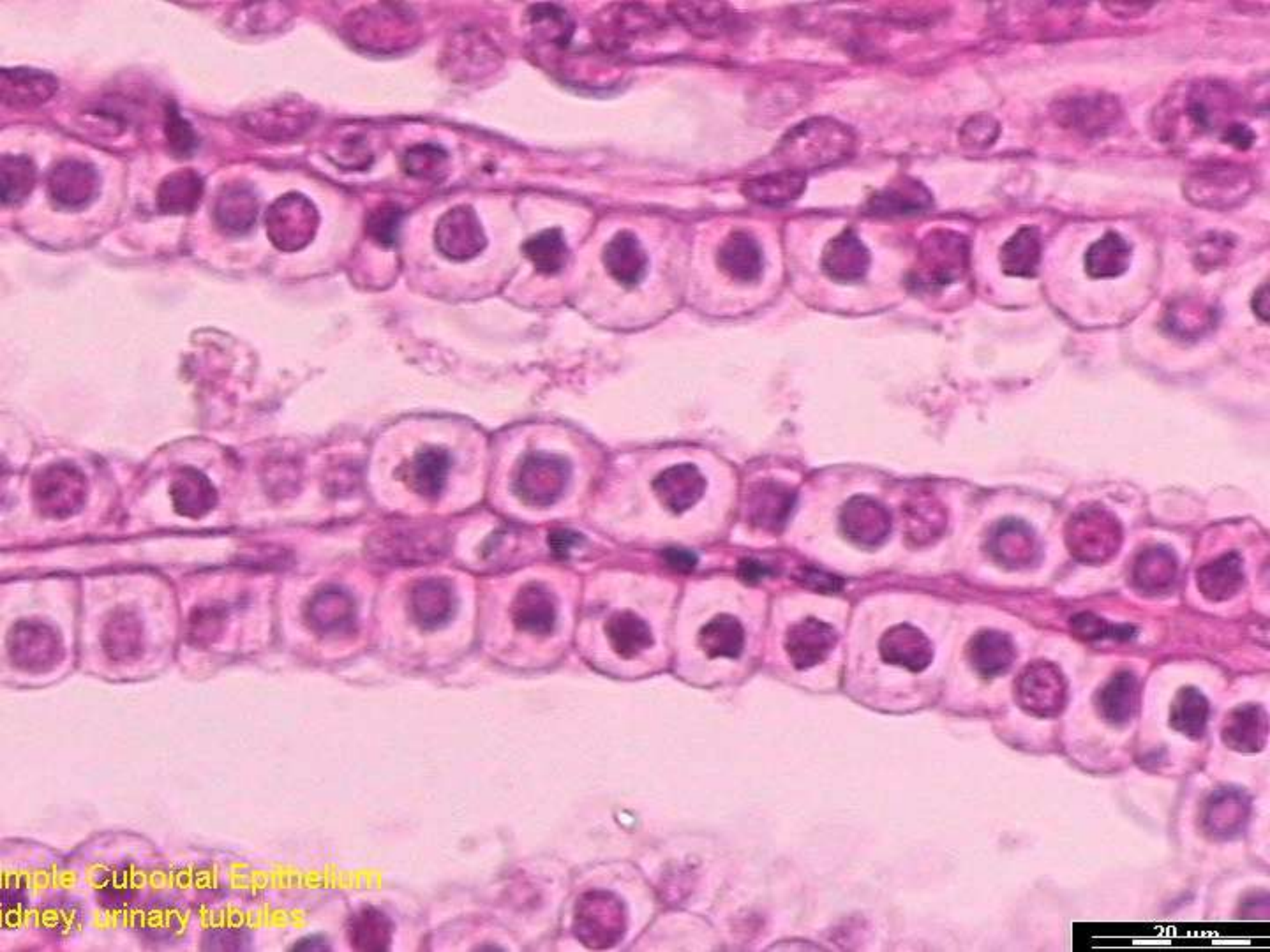


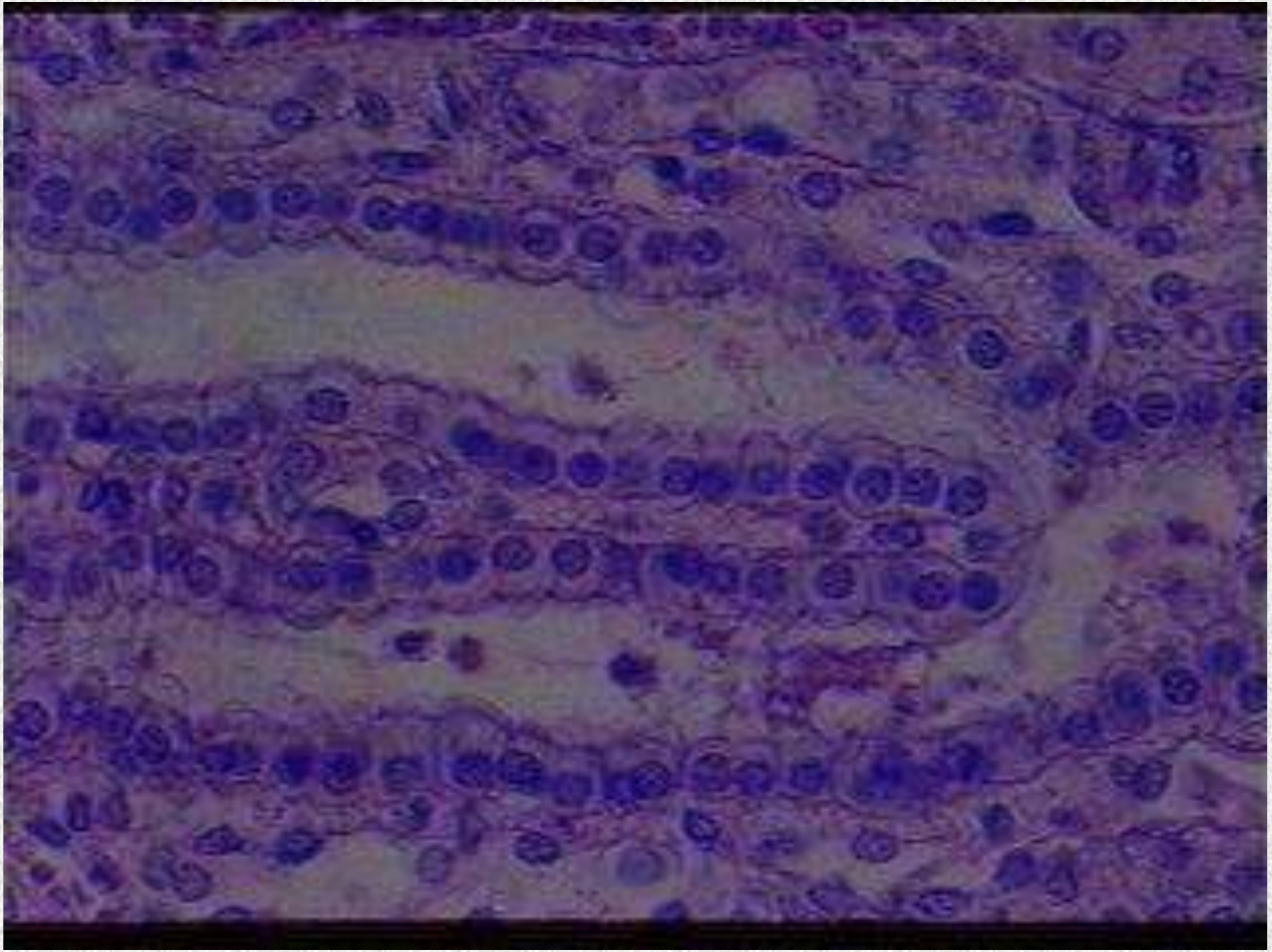




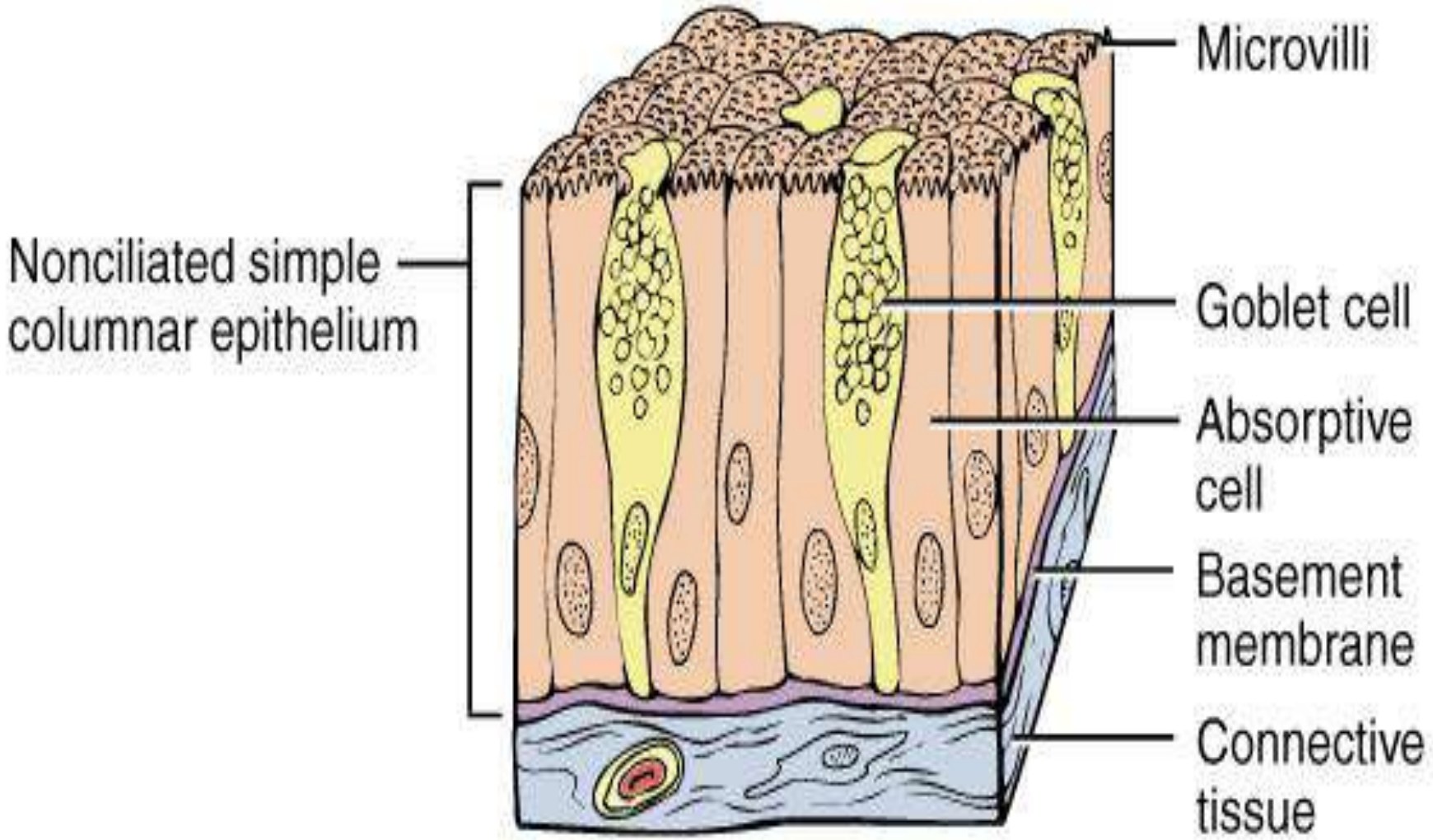
Cuboidal- cube shaped, secretion, absorption:glands, ducts, kidneys

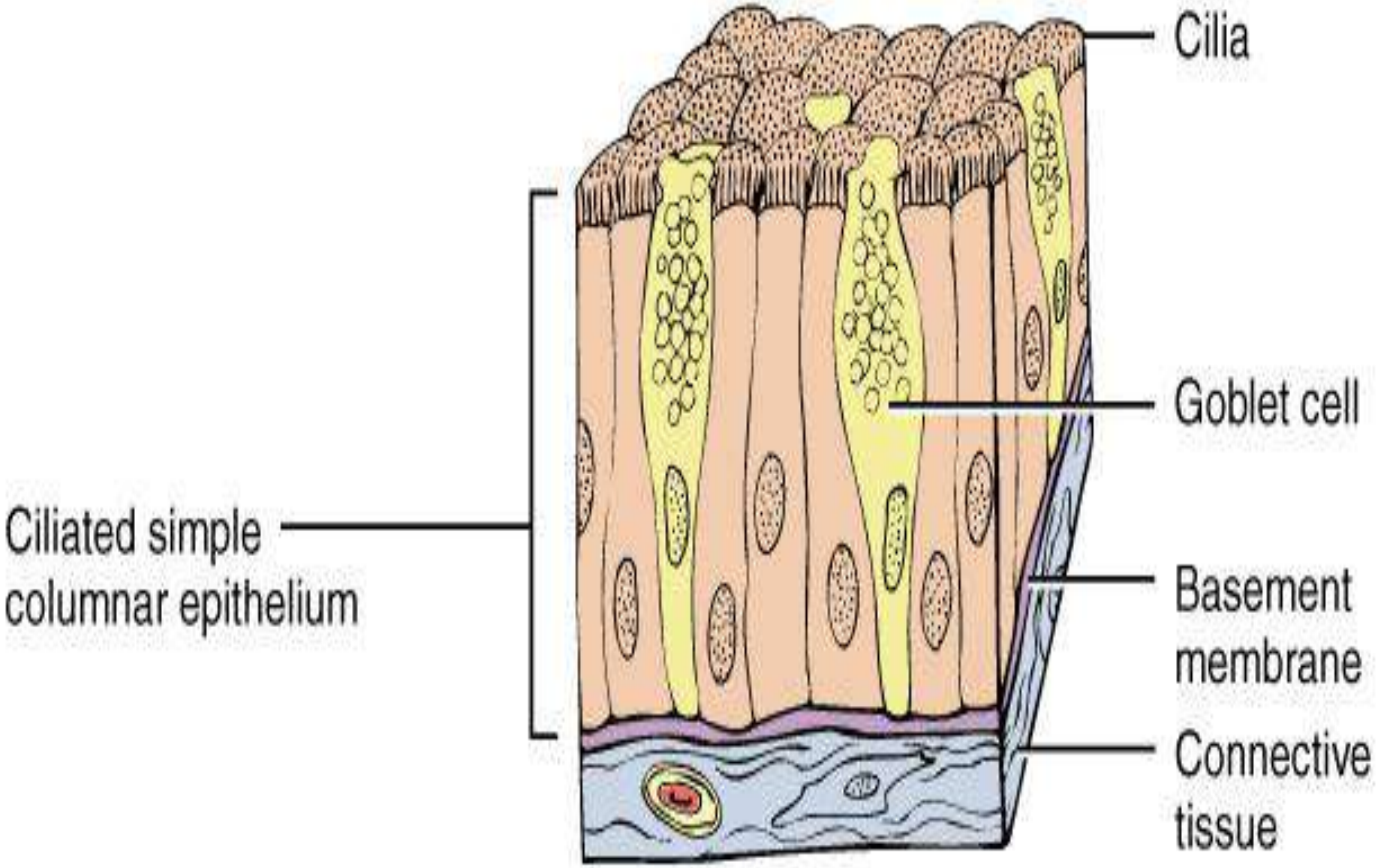

Simple cuboidal cell
Basement membrane
Connective tissue

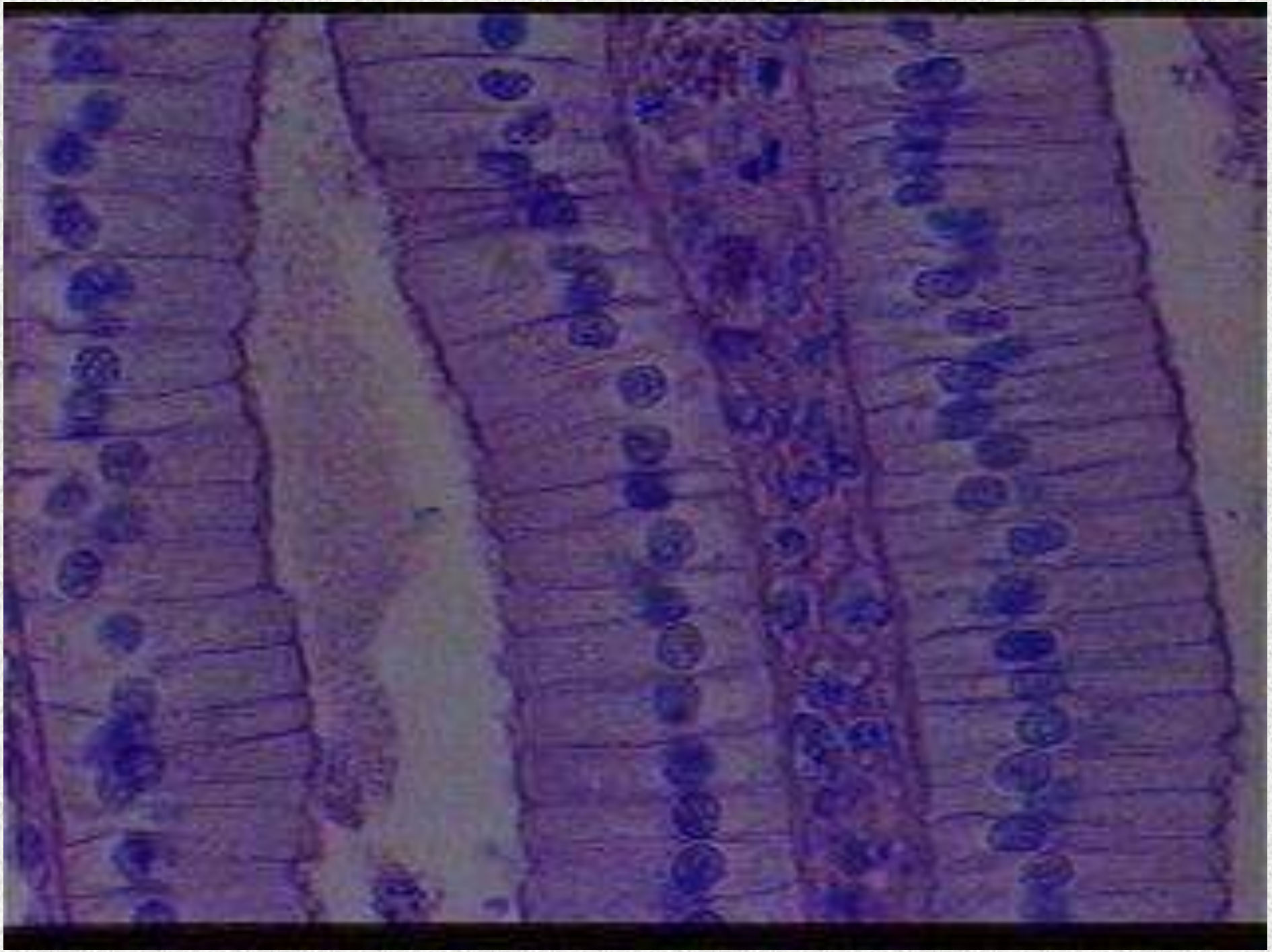

imple Cuboidal Epithelium
idney, urinary tubules
20 um



Columnar- tall, narrow, secretion, absorption: intestines, urterus


Nonciliated simple columnar epithelium
Microvilli
Goblet cell
Absorptive cell
Basement membrane
Connective tissue


Cilia
Goblet cell
Ciliated simple columnar epithelium
Basement membrane
Connective tissue

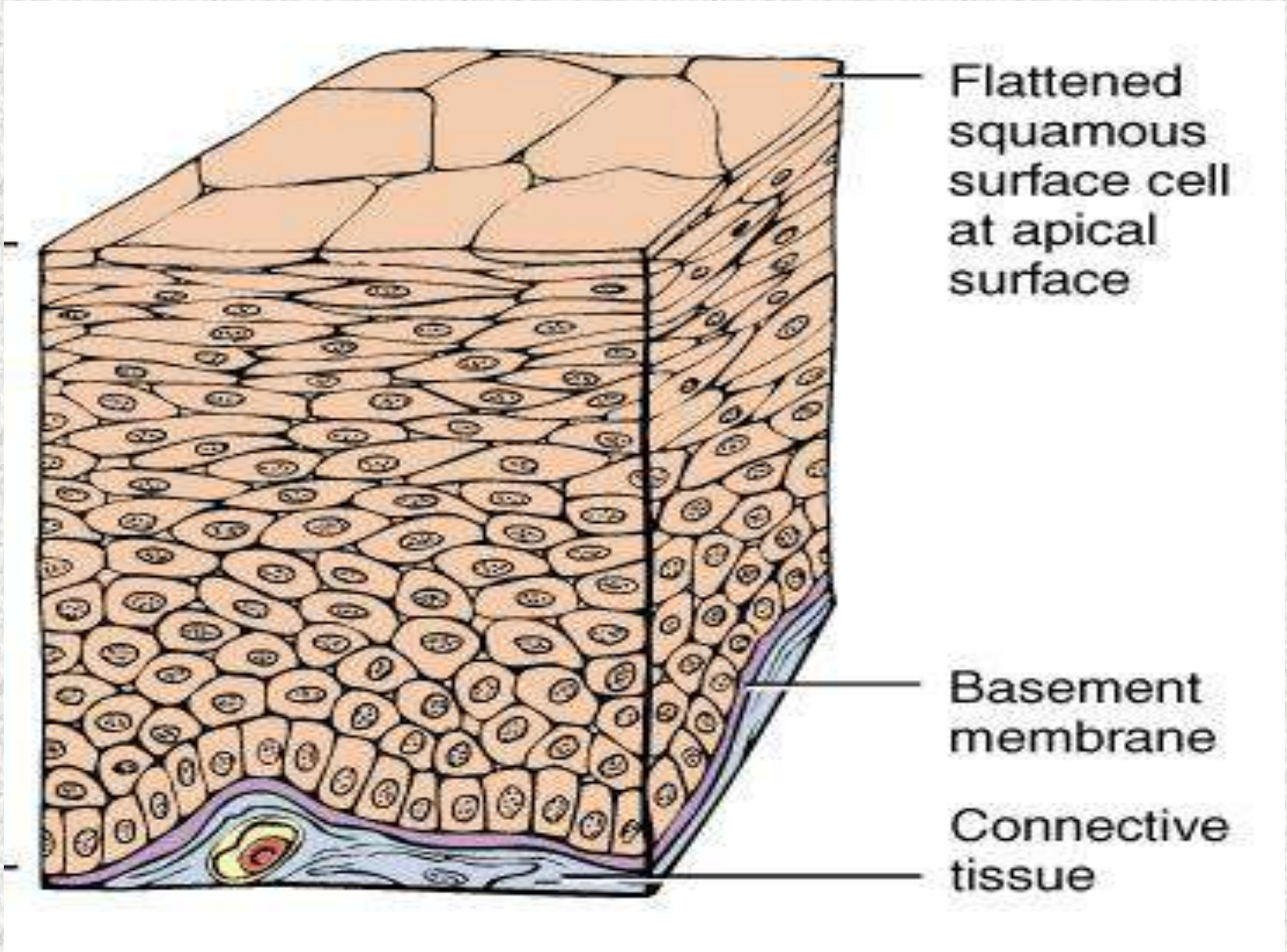


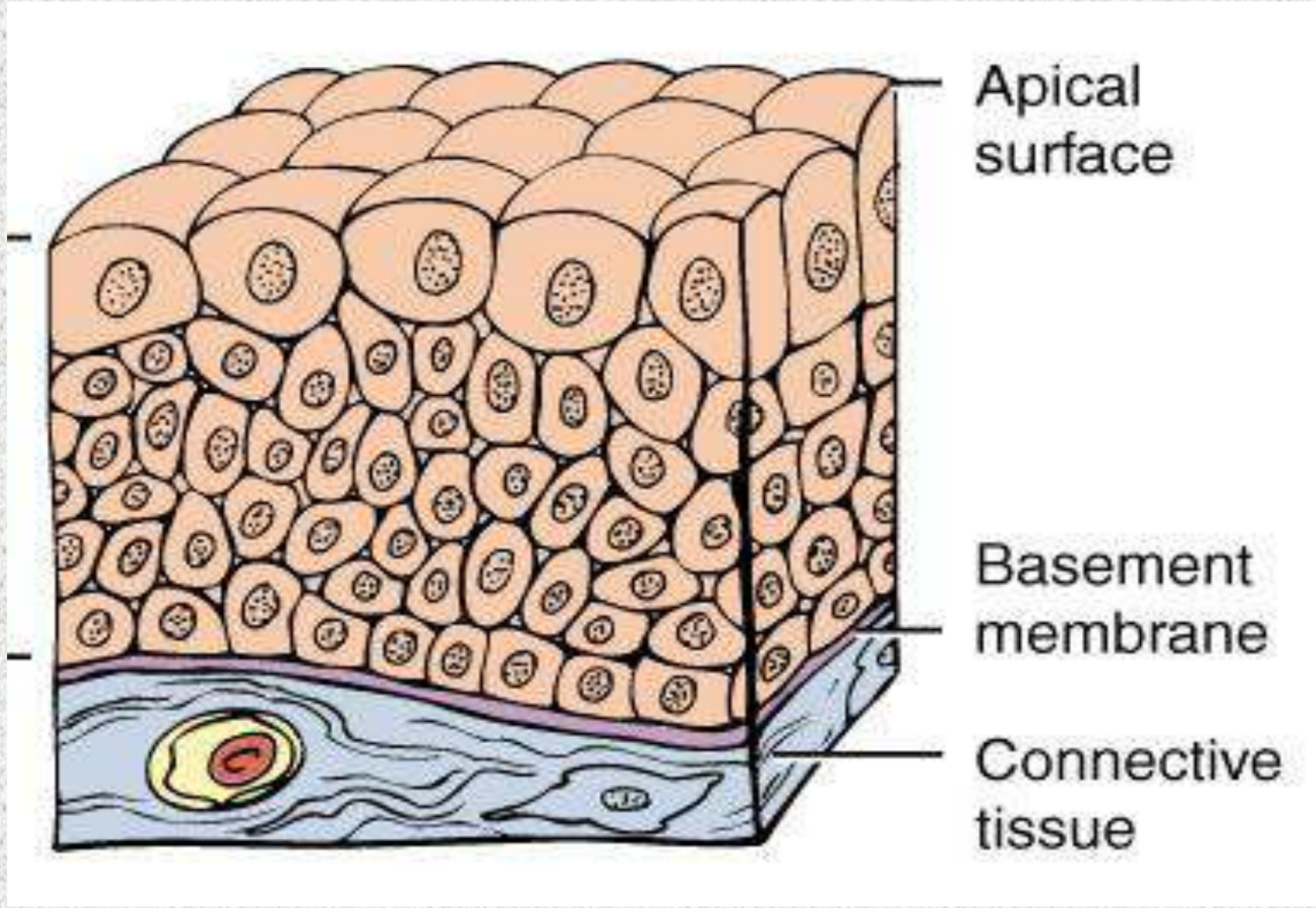

G
G
G
G
Simple Columnar Heterogeneous Epithelium
Jejunum. G=Goblet cell
20 um

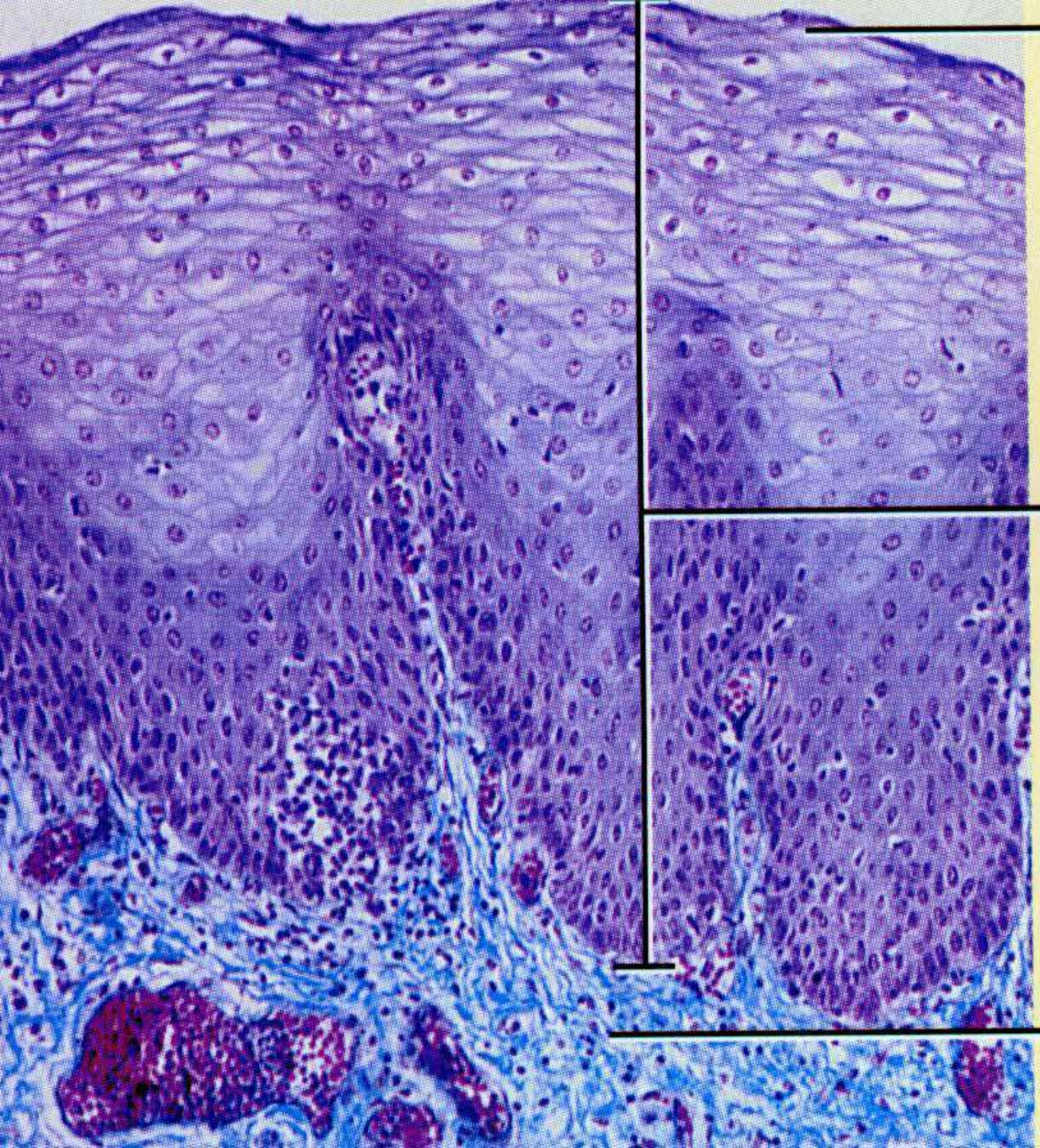
Stratified epithelium- more than 1 layer

Squamous- flattened:skin, mouth, throat

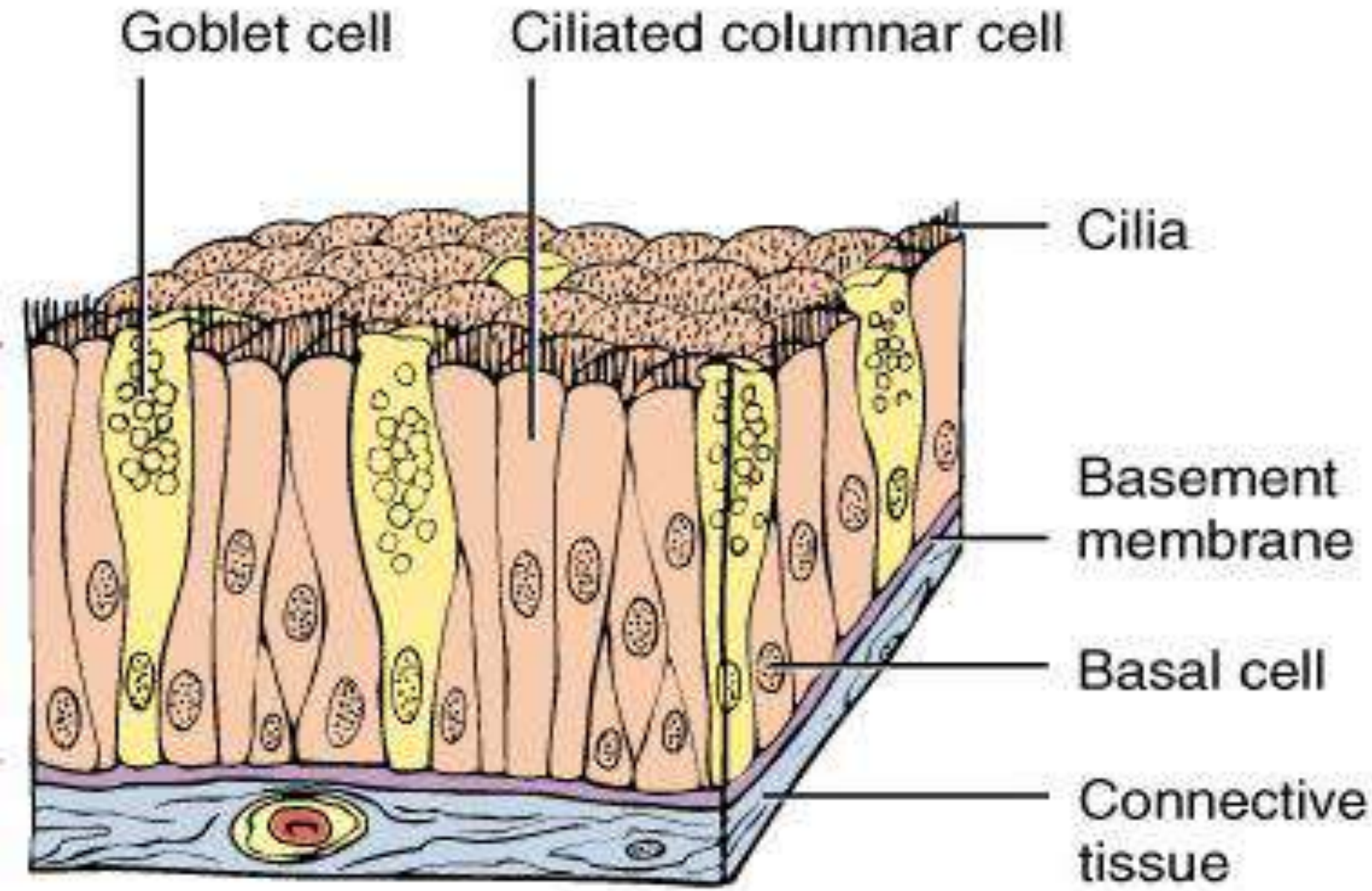
Transitional- changes shape: urinary bladder

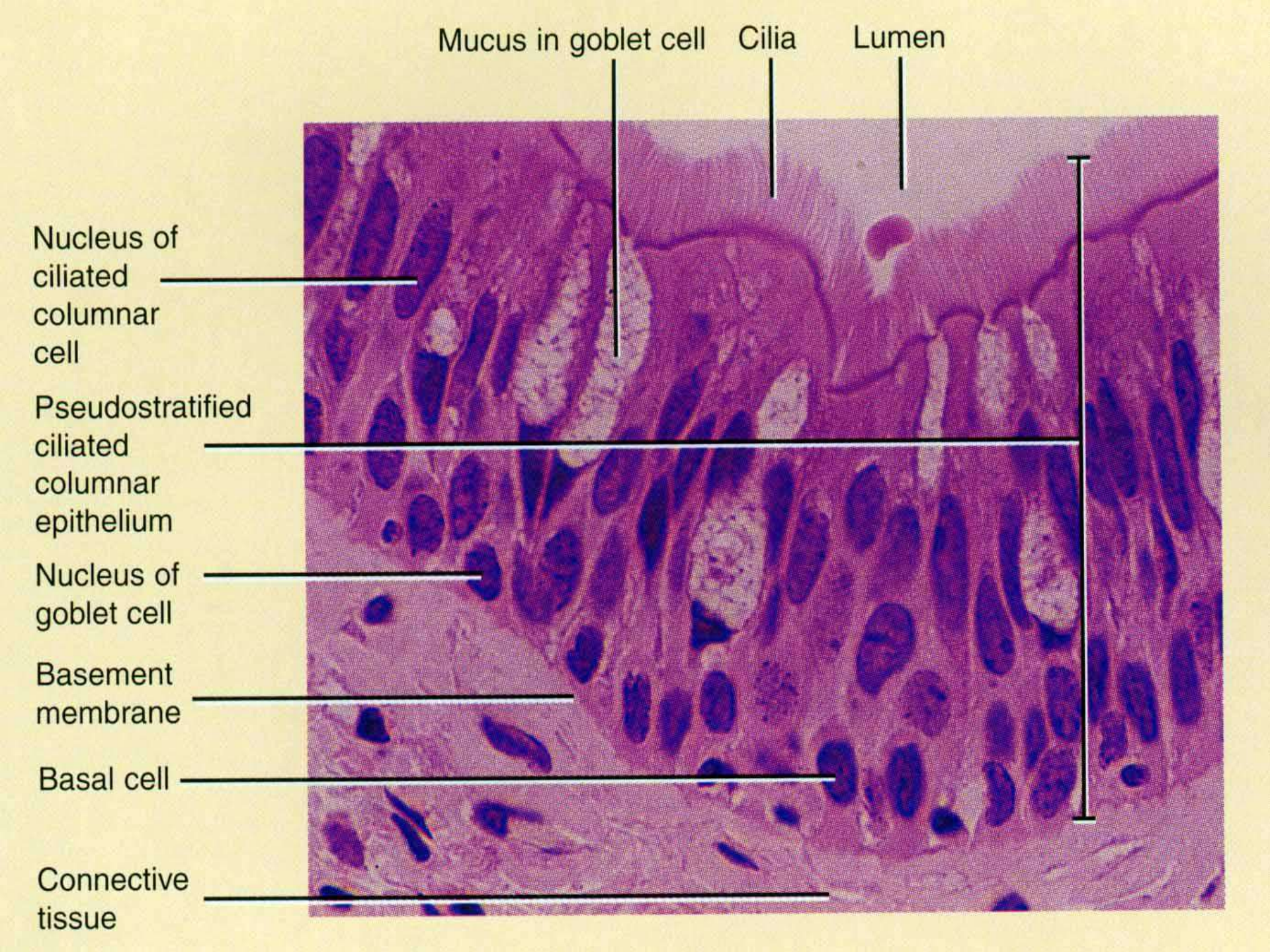

Flattened squamous surface cell at apical surface
Basement membrane
Connective tissue


Apical surface
Basement membrane
Connective tissue


Flattened squamous surface cell
Stratified squamous epithelium
Connective tissue

Pseudostratified- not a real stratified, a special type of simple, secretion and movement of mucus: nasal cavity, sinuses


Goblet cell
Ciliated columnar cell
Cilia
Basement membrane
Basal cell
Connective tissue


Mucus in goblet cell
Cilia
Lumen
Nucleus of ciliated columnar cell
Pseudostratified ciliated columnar epithelium
Nucleus of goblet cell
Basement membrane
Basal cell
Connective tissue

Connective Tissue

Has three basic elements: 1) cells 2)ground substance 3) fibers.

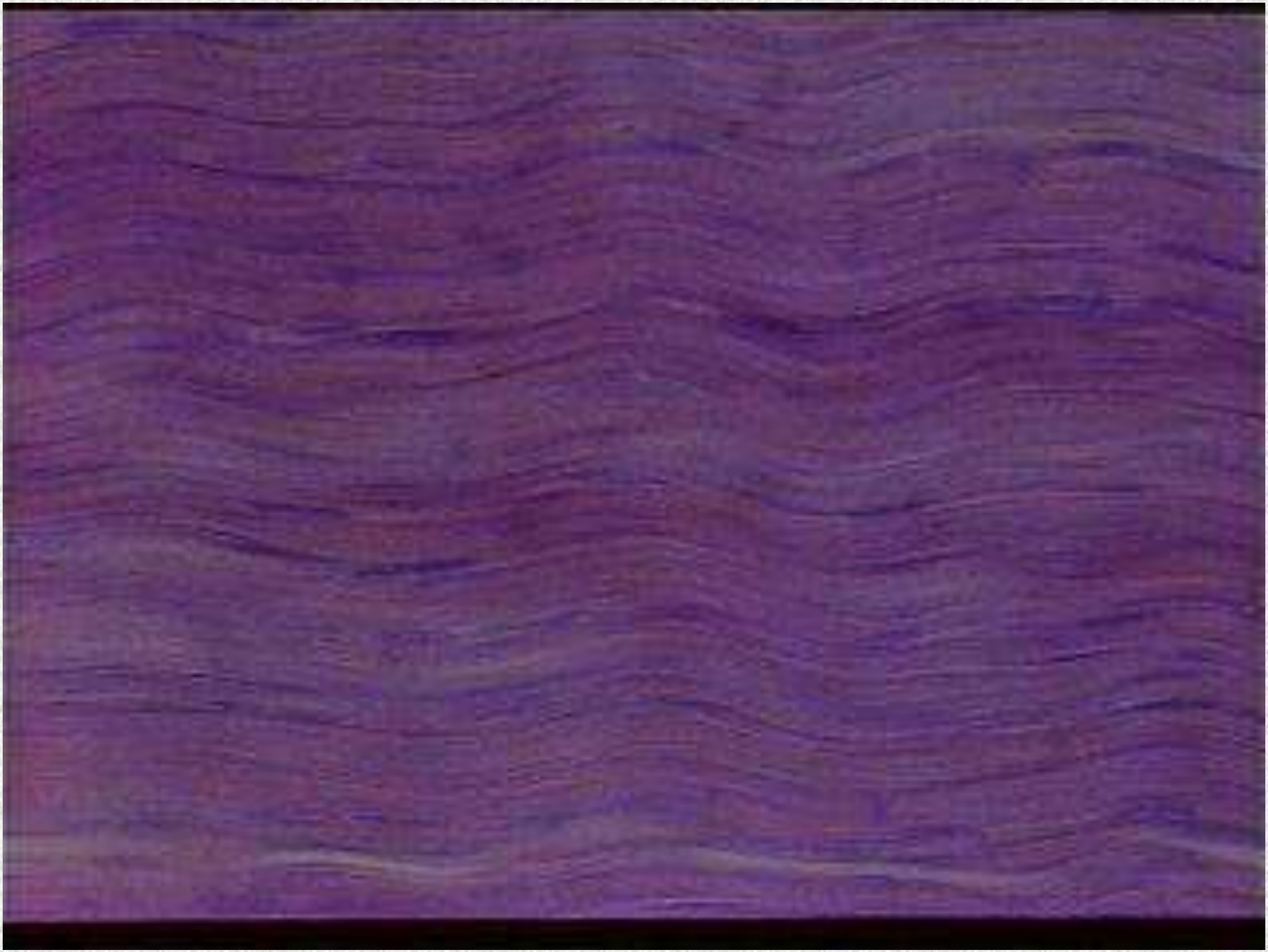
The ground substance(the material between the cells) and the fibers make up the matrix.

The matrix may be fluid, calcified, or gelatinous. The fibers may be made of collagen, a protein that is tough and flexible or elastic fibers, which can be stretched without breaking.

Types of Connective Tissue

Dense Connective Tissue

Numerous thick fibers: tendons and ligaments.

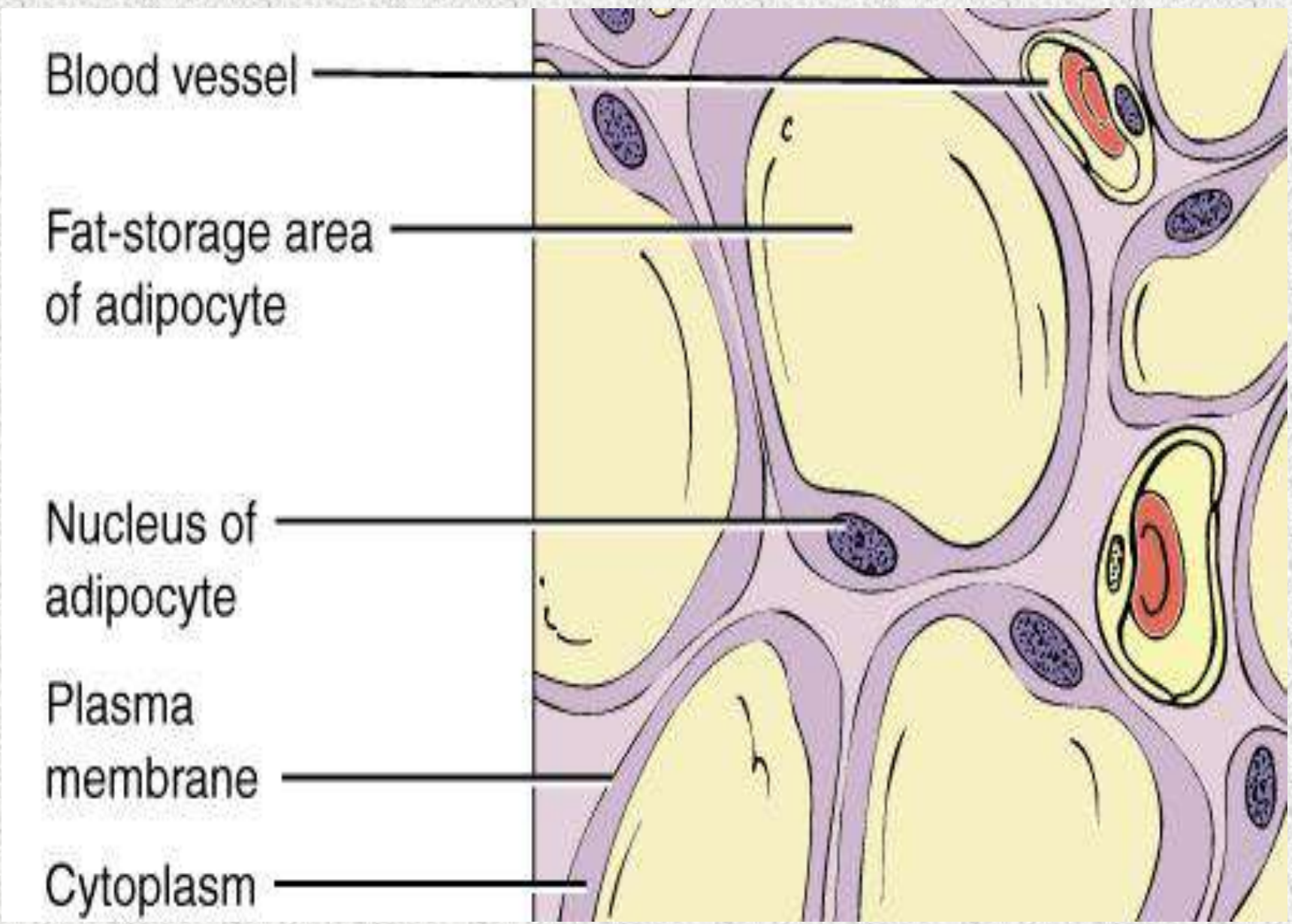


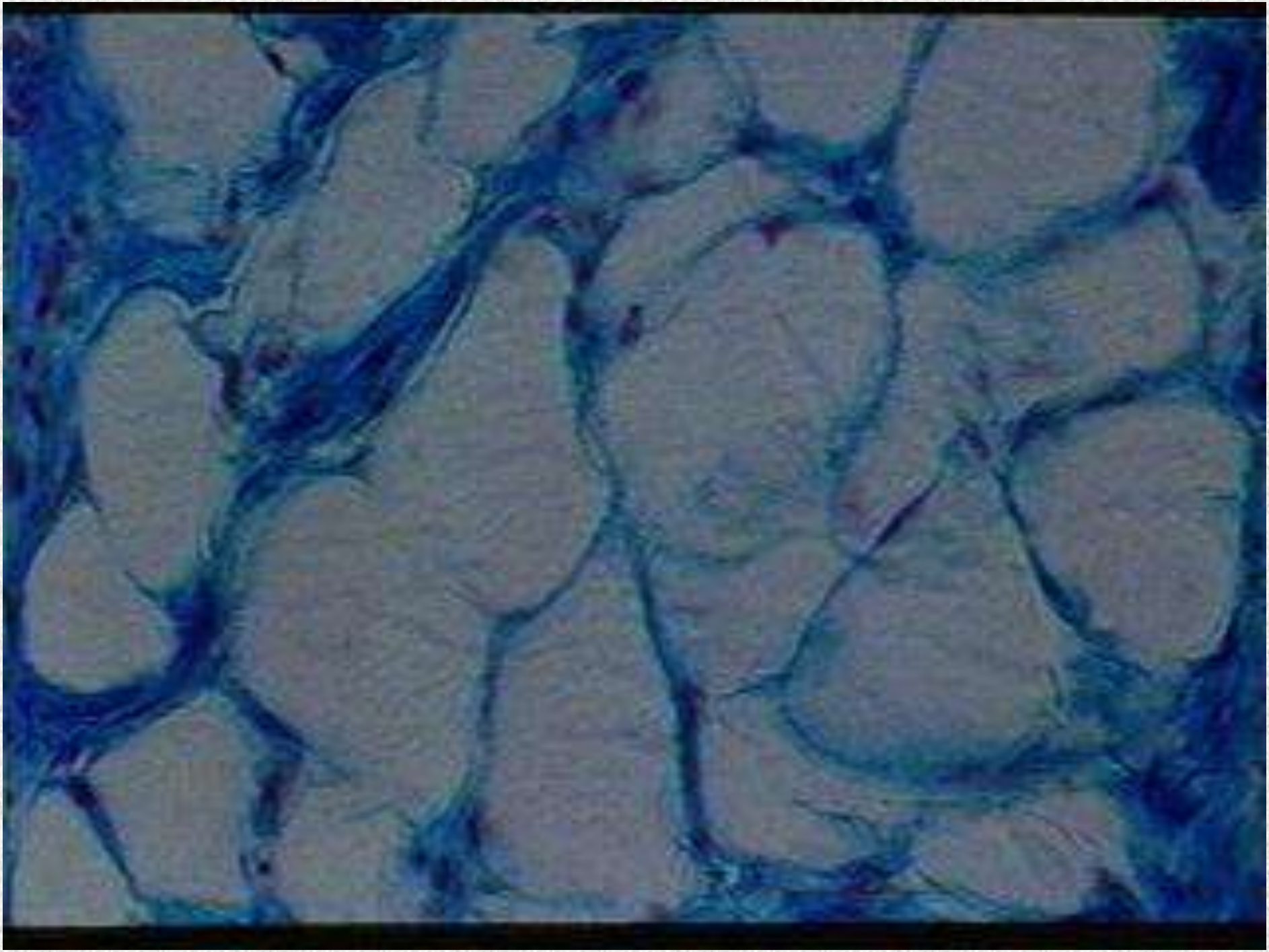
Loose Connective Tissue

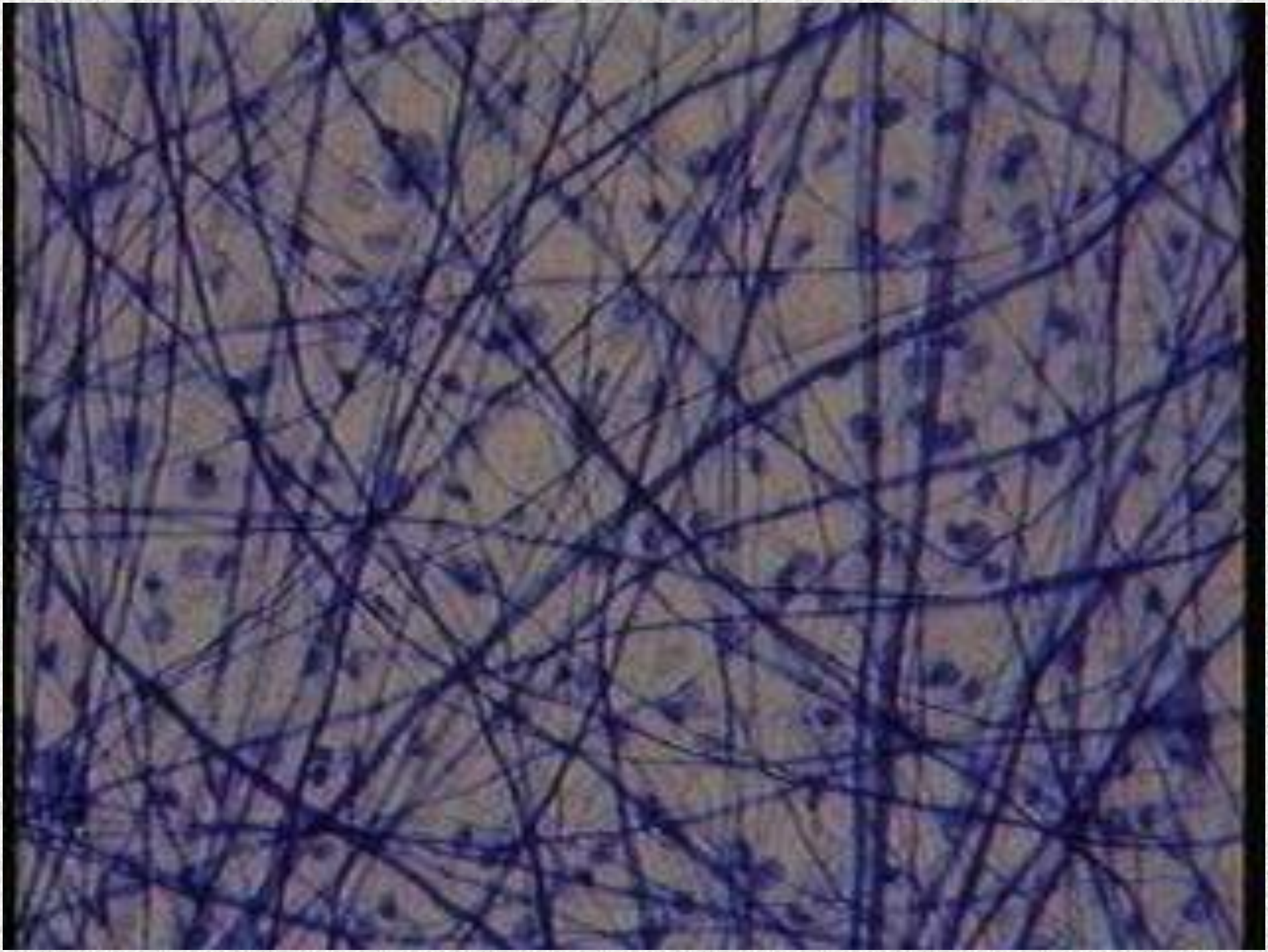
Fewer loosely arranged fibers

Adipose- Very few fibers,fat storage

Areolar-Connects the skin to underlying tissues and organs

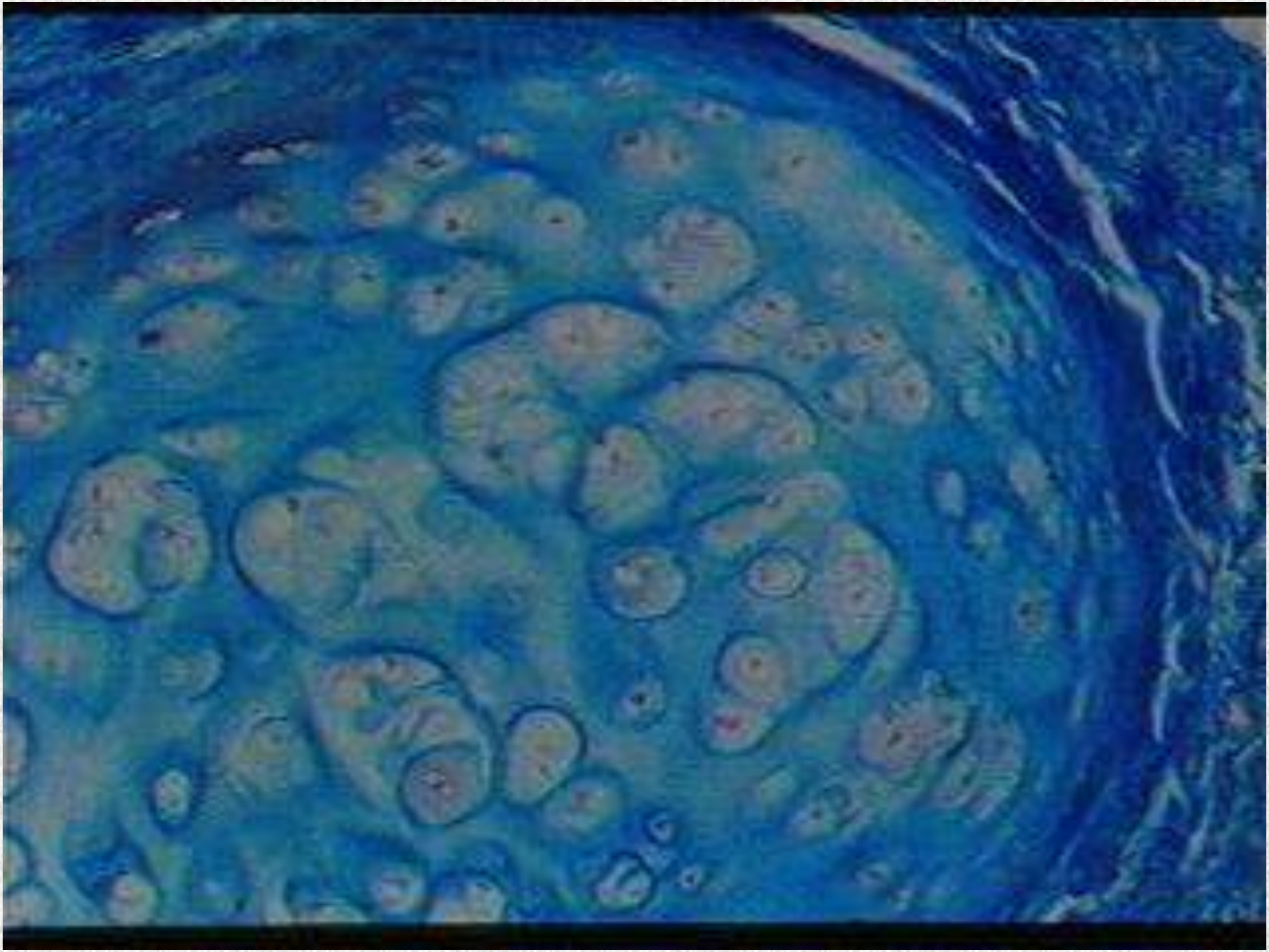

Blood vessel
Fat-storage area of adipocyte
Nucleus of adipocyte
Plasma membrane
Cytoplasm





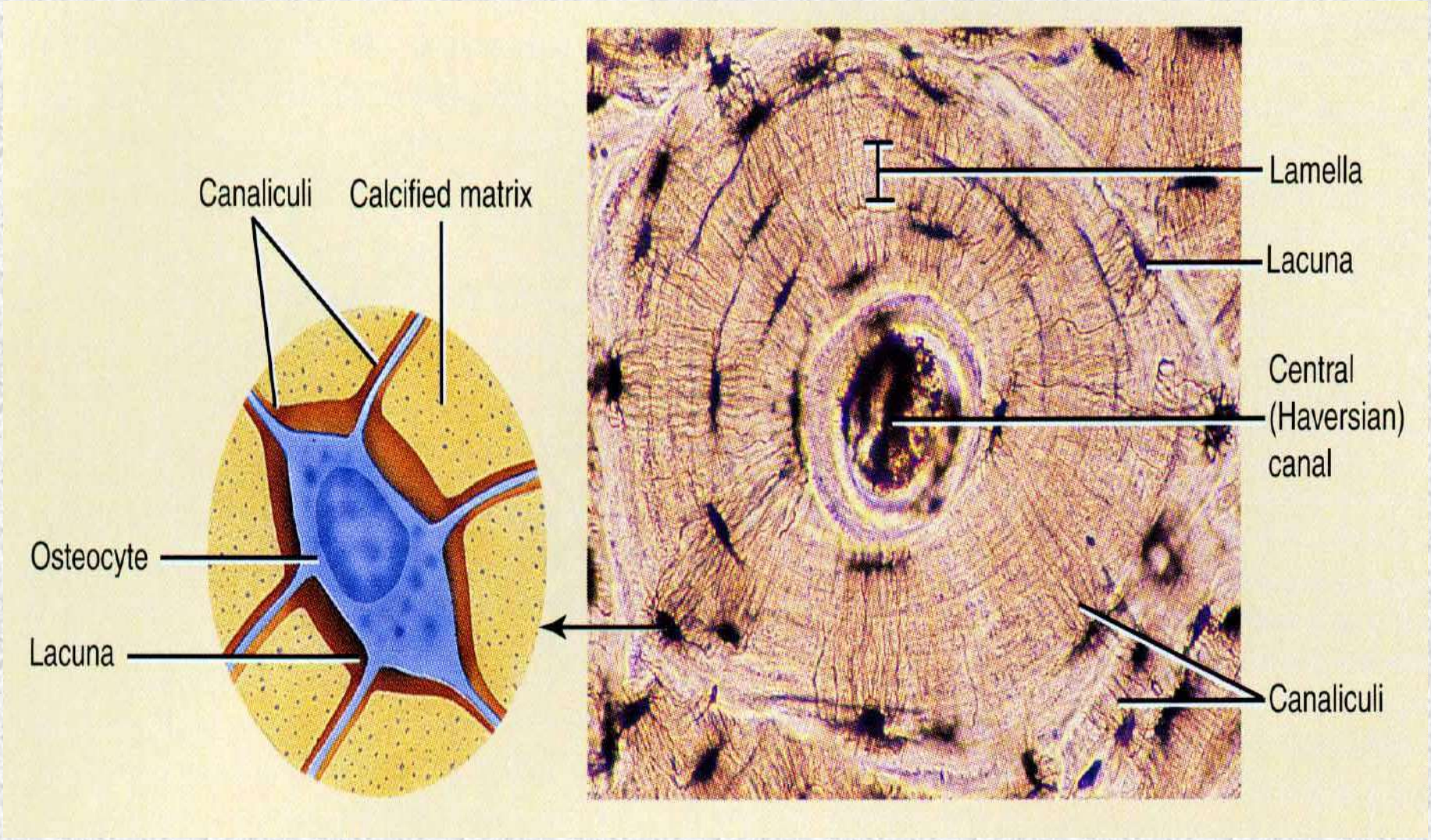
Cartilage

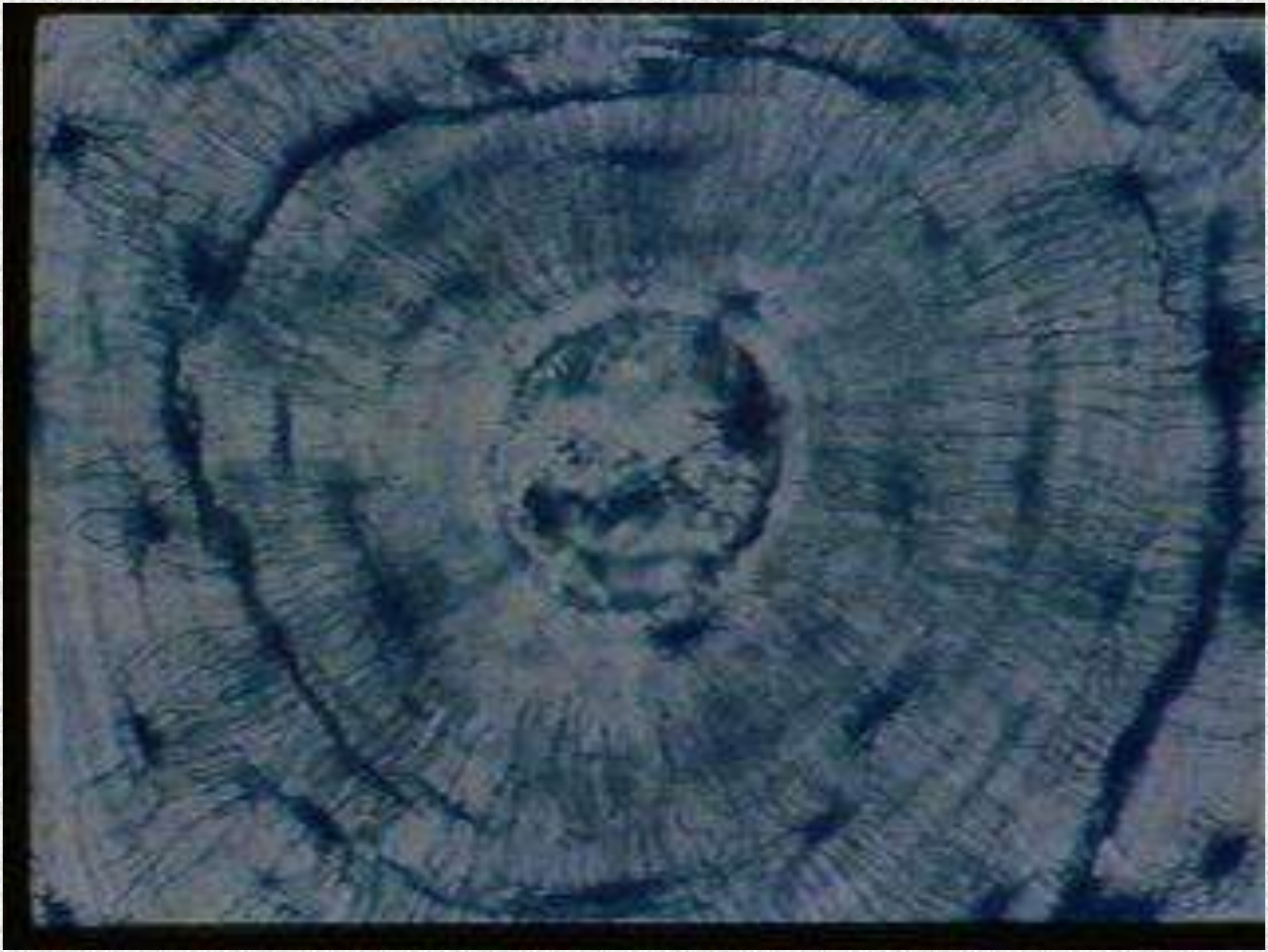
Cartilage cells are chondrocytes.A dense network of collagen and elastic fibers. Jelly-like ground substance.No nerves and blood vessels.



Bone

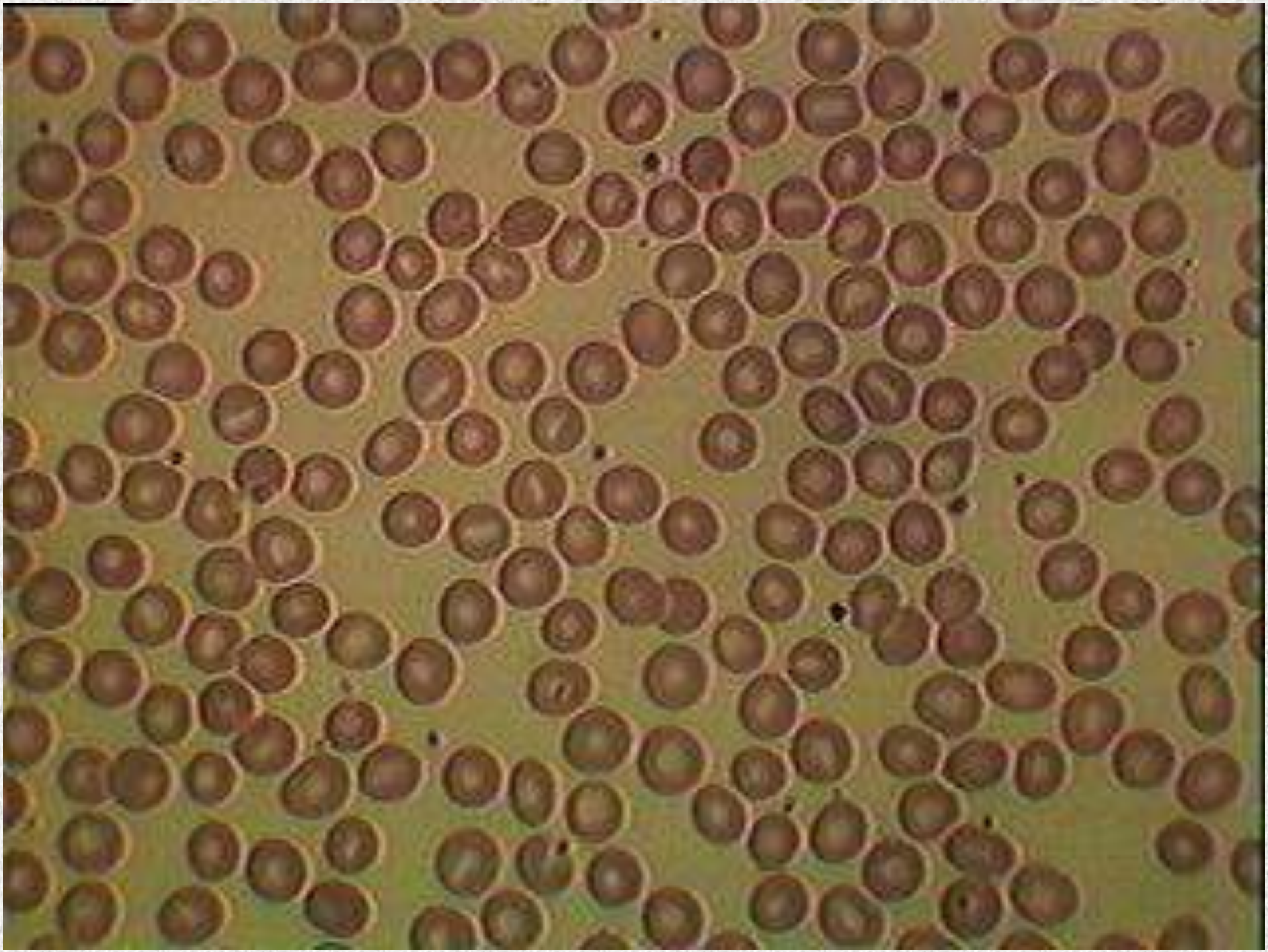
Osteocytes: Bone cells.Some collagen and elastic fibers, ground substance calcified.


Canaliculi
Calcified matrix
Osteocyte
Lacuna
Lamella
Lacuna
Central
(Haversian)
canal
Canaliculi



Blood

Blood cells: erythrocytes (RBC), leucocytes(WBC), platelets. Has a liquid matrix(plasma). Transport system that connects various body parts.



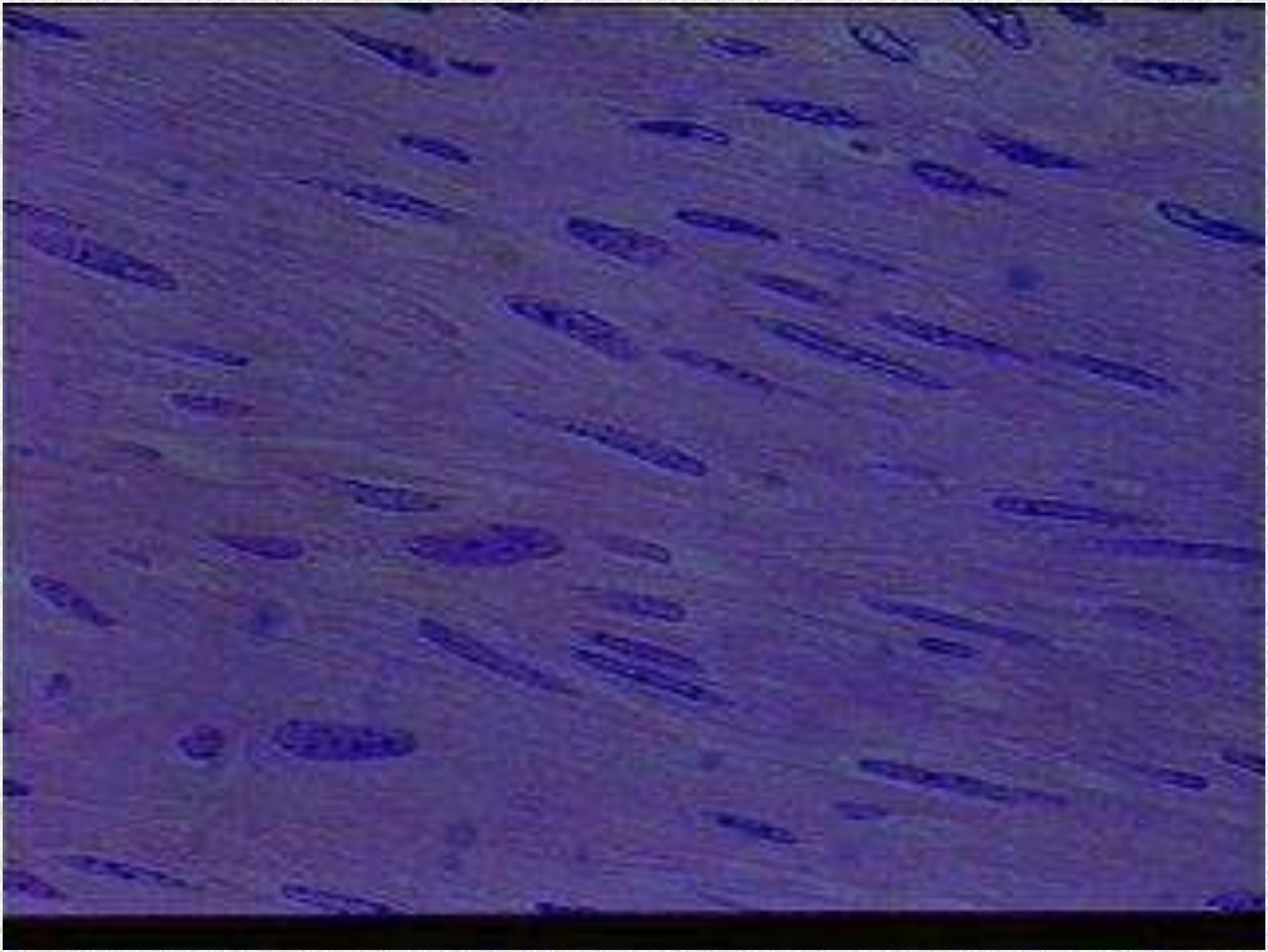
Muscle Tissue

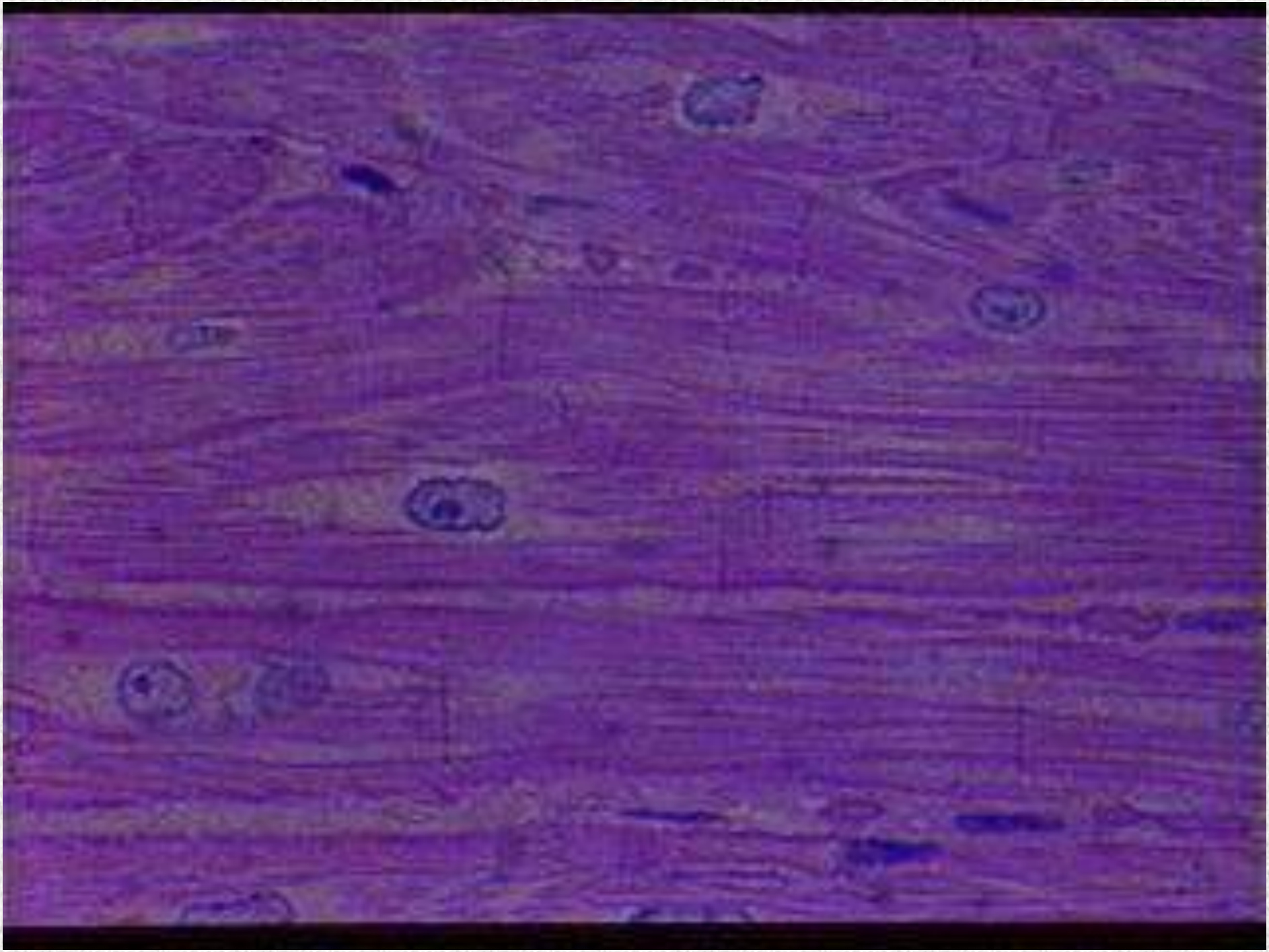
Cells specialized for contraction to produce movement.

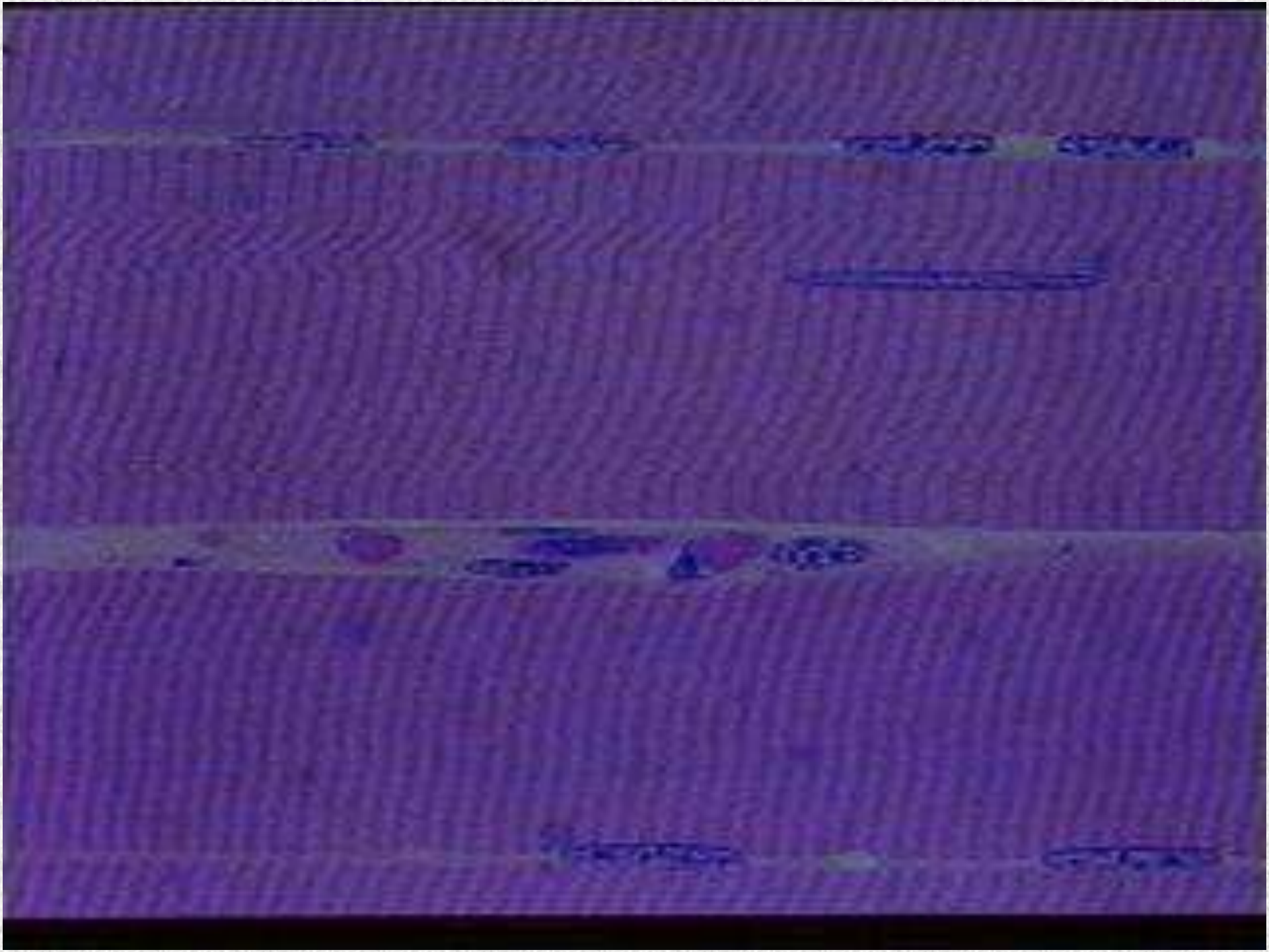
1)skeletal muscle-attached to bone

2) smooth muscle-internal organs

3) cardiac muscle-heart







Nervous Tissue

Neurons are cells that transmit electrochemical impulses. **Neuroglia** are cells that support , nourish, protect, and insulate neurons.