

Tissues Chapter 5Tissue - a group or mass of similar cells working together to perform certain common functions

There are 4 major types of tissue

- Epithelial
- Connective
- Muscle
- Nervous

1. Epithelial Tissue

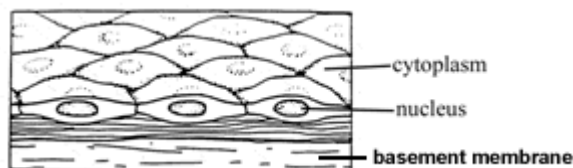
General Characteristics:

- Found throughout the body, covers all body surfaces both inside and out.
- Main glandular tissue.
- Attached to underlying connective tissue by noncellular nonliving basement membrane.
- Usually has no vascular tissue - blood supply
- Cells reproduce rapidly (rapid healing).
- Cells tightly packed together

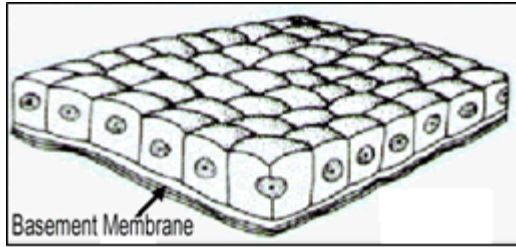
Functions: Protection, secretion, absorption, excretion, sensory perception

Six Specific types of epithelial tissue - categorized based on the shape of the cells and the layers of cells. (* We won't distinguish glandular epithelium because it is of the cuboidal or columnar type.)

A. SIMPLE SQUAMOUS - single layer (simple) of very thin, flattened cells (squamous). Function: diffusion and filtration. Found in air sacs of lungs, walls of capillaries.

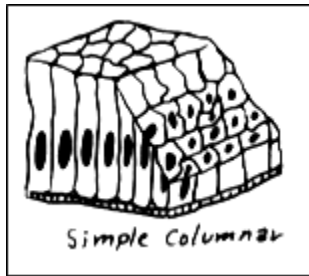


B. SIMPLE CUBOIDAL - single layer, cube-shaped cells. Function: Secretion and absorption. Found: Lining of kidney tubules, ducts of glands, covering surface of ovaries



C. SIMPLE COLUMNAR - single layer, elongated cells with their nuclei in about the same position in each cell (usually near the basement membrane). Protection, secretion, absorption. Found in the lining of digestive tract and uterus

- contains scatter goblet cells functioning in the secretion of mucus
- some columnar cells (involved in absorption) have tiny finger-like processes from their free surface called microvilli (increases surface area)



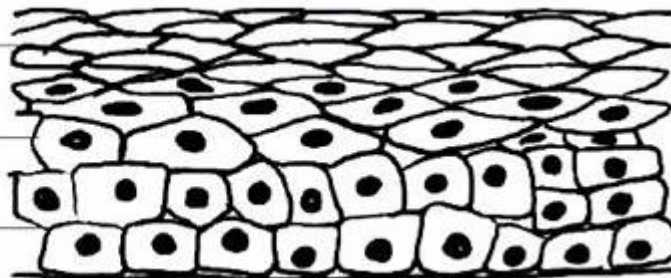
D. STRATIFIED SQUAMOUS - multi-layered, squamous cells. Thicker tissue. Functions in protection. Found lining body cavities like the mouth and outer layer of skin



flattened cells worn away from top surface

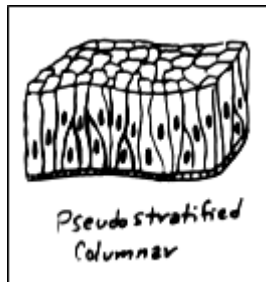
flattened cells worn away from top surface

cells at base divide by mitosis

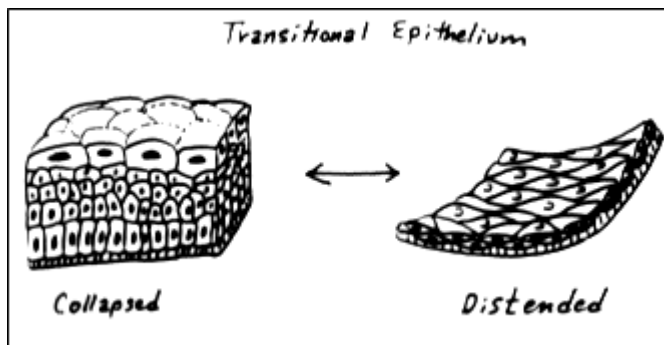


E. PSEUDOSTRATIFIED COLUMNAR - appear "stratified" but really a single layer with nuclei at various levels giving the appearance of layered cells. Usually ciliated (tiny, hair-like projections for sweeping materials along a surface). Contains goblet cells.

- Function: secretion and cilia-aided movement
- Location: lining air passages like the trachea and tubes of the reproductive system



F. TRANSITIONAL EPITHELIUM - thick, layered cuboidal cells. "Stretchable" tissue, also forms barrier to block diffusion. Found: lining of urinary bladder.



2. Connective Tissue

General Characteristics:

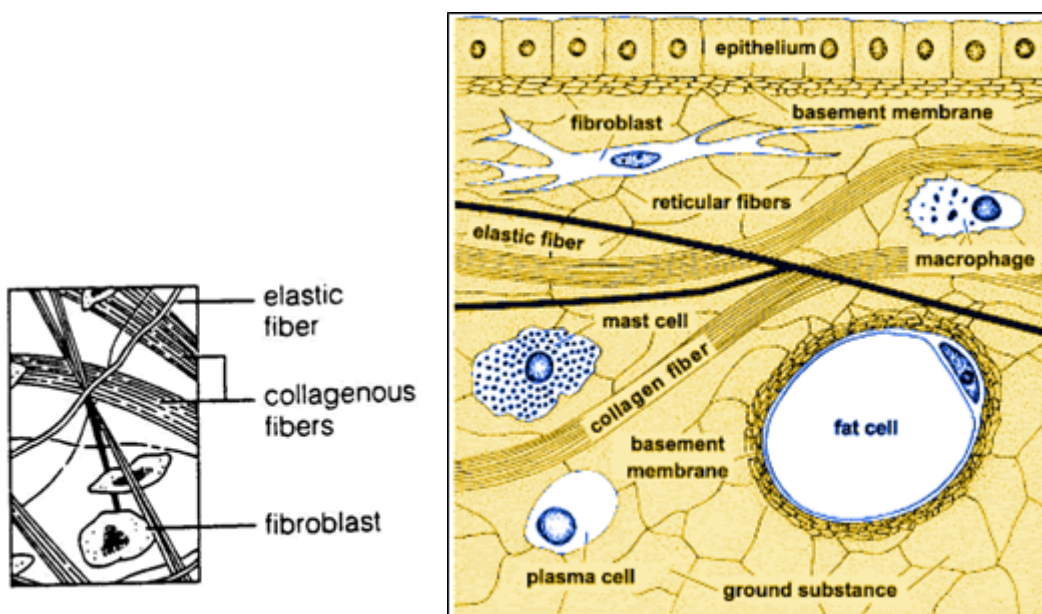
- Most abundant tissue in your body, found throughout
- Binds structures together
- Provides support, protection, framework, fills space, stores fat, produces blood cells, fights infection, and helps repair tissue.
- Composed of more scattered cells with abundant intercellular material ' matrix
- Made up of a ground substance (fluid, semi-solid) and fibers
- Most has a good blood supply
- Cells can reproduce
- Three Common types of cells:

1. mast cells (prevents blood clots)
2. macrophages (phagocytic) and
3. fibroblasts (most abundant, produce fibers)

main types of fibers:

-collagenous fibers - thick, made of protein collagen, major structural protein in the body, appear in long parallel bundles. Strong, flexible, but not very elastic, also known as white fibers. (bones, ligaments, tendons)

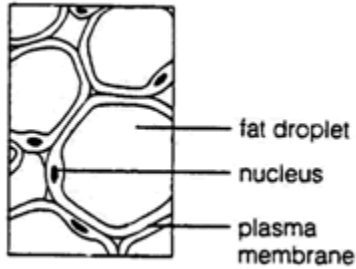
- elastic fibers - microfibrils in protein elastin, yellow fibers. Not as strong, but very elastic (respiratory and vocal cords)



CATEGORIES OF CONNECTIVE TISSUE

A. LOOSE C.T. or AREOLAR TISSUE - binds skin to underlying organs and organs to organs, space between muscles, throughout body

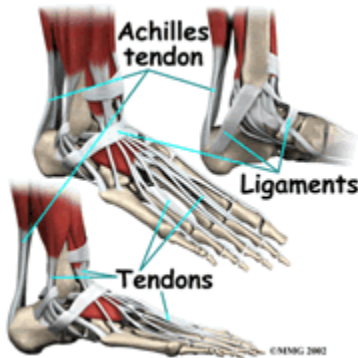
B. ADIPOSE TISSUE - aka FAT, beneath skin, around kidneys and eyeballs, abdominal membranes. Function: Protective cushion, insulation to preserve body heat, stores energy, cells are called adipocytes



C. FIBROUS C.T. - dense tissue, closely packed, thick collagenous fibers and fine network of elastic fibers. Few cells, poor blood supply, thus slow healing.

Tendons - connect muscles to bones

Ligaments - connect bones to bones



CARTILAGE (all cartilage cells are called chondrocytes)

D. HYALINE CARTILAGE - very fine white (collagenous) fibers. Most common cartilage. Covers ends of bones and joints, noise, respiratory passages.

E. ELASTIC CARTILAGE - more flexible and elastic, external ear and larynx

F. FIBROCARTILAGE - very tough, large numerous collagenous fibers. Intervertebral disks, menisci

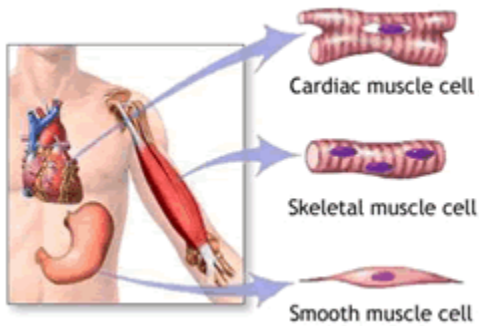
G. BONE TISSUE - Osseous tissue. Rigid due to mineral salts. Layers - lamellae, haversian canals, osteocytes

H. BLOOD TISSUE - circulates throughout the body

I. RETICULOENDOTHELIAL - found scattered throughout the body

3. Muscle Tissue

- A. Skeletal - skeletal muscles
 - voluntary (striated)
- B. Smooth - in hollow organs, stomach
 - involuntary
- C. Cardiac - wall of the heart



4. Nerve Tissue

Found in brain, spinal cord, nerves

- A. Neurons - transmit signals
- B. Neuroglia - protection, support

