

Connective Tissues:

A. Characteristics of connective tissues:

- 1) cells are separated by a **extracellular matrix** (organic ground substance plus fiber)
- 2) abundant **blood supply** (except cartilage)

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B. Connective Tissue Fibers

- 1) **Collagenous fibers** (white thick fibers that provide great strength)
- 2) **Elastic fibers** (yellow thin elastin fibers that stretch easily)
- 3) **Reticular fibers** (very thin collagenous fibers that lend delicate support)

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Fibers in Loose Connective Tissue

A micrograph of loose connective tissue. The image shows a dense network of fibers and scattered cells. Labels on the left side include: collagen fibers, elastic fibers, reticular fibers, and ground substance. Labels on the right side include: fibroblasts, macrophages, mast cells, and adipocytes. The overall appearance is a complex, interconnected mesh of fibers with small, dark-staining nuclei of cells interspersed throughout.

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Fibrous connective tissue can be:

- ◆ **Loose connective tissue:** fibroblasts separated by jellylike ground substance
- ◆ **Dense connective tissue:** contains bundles of collagenous fibers with fibroblasts embedded in between

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Categories of loose connective tissue:

- 1) **Areolar tissue:** composed of fibroblasts located some distance apart among collagenous and elastic fibers.
- 2) **Adipose tissue:** type of loose connective tissue where adipocytes (enlarged fibroblasts) store fat.

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1. Areolar Tissue

- ◆ **Location:** between muscles beneath the skin
- ◆ **Function:** Binds organs together

A micrograph of areolar tissue, showing a dense network of fibers and scattered cells. The fibers are stained purple, and the cells are stained pink. The overall appearance is a complex, interconnected mesh of fibers with small, dark-staining nuclei of cells interspersed throughout.

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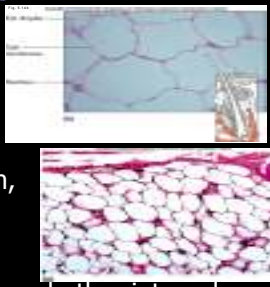
2. Adipose Tissue

◆ FUNCTION:

store fat
insulation

◆ LOCATION:

beneath the skin,
around joints,
breast,
padding kidneys and other internal
organs



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3. Dense Regular Connective Tissue

◆ LOCATION:

tendons and ligaments

◆ FUNCTION:

binds organs together



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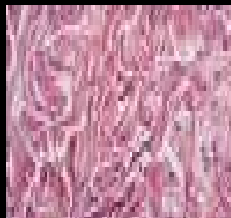
4. Dense Irregular Connective Tissue

◆ LOCATION:

inner layer of skin
synovial joints

◆ FUNCTION:

interconnects organs
resists forces



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Cartilage Tissues

Cartilage cells (chondrocytes) lie in small chambers (lacunae) in the solid yet flexible matrix.



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Categories of Cartilage Tissue

- ◆ **Hyaline cartilage:** matrix contains only fine collagenous fibers and has a glassy, opaque appearance
- ◆ **Elastic cartilage:** matrix contains many elastic fibers as well collagenous fibers.
- ◆ **Fibrocartilage:** matrix contains strong collagenous fibers.

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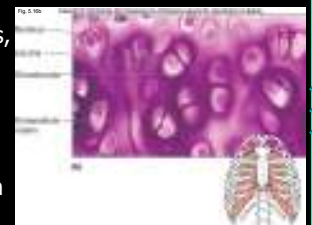
5. Hyaline cartilage

LOCATION:

ends of bones & ribs,
nose,
rings of trachea

FUNCTION:

support & protection

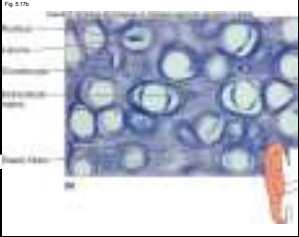


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6. Elastic cartilage

LOCATION:
ear
larynx

FUNCTION:
provides framework

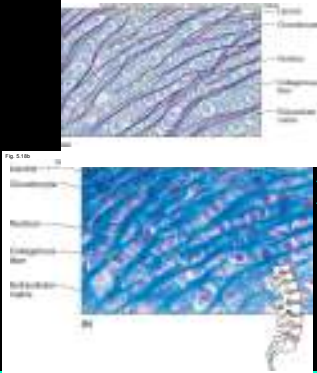


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7. Fibrocartilage

LOCATION:
intervertebral disks
knees
pelvic girdle

FUNCTION:
absorbs shock



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- ◆ Bone has an extremely hard matrix of mineral salts, deposited around collagenous fibers



1. **Compact bone:** consists of many cylindrical-shaped units (osteons or Haversian systems)
2. **Spongy bone:** contains numerous bony bars and plates (trabeculae) separated by irregular spaces.

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8. Bone

FUNCTION:
Blood cell formation
Body support
protection
provides framework

LOCATION:
Bones of skeleton

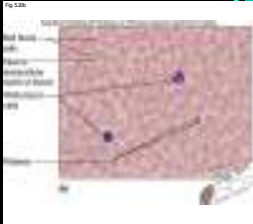
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9. Blood (fluid connective tissue)

STRUCTURE:
composed of cells (red and white) and platelets
suspended in a liquid matrix called plasma

FUNCTION:
Red: transports substances
White: defend from diseases
Platelets: initiate blood clotting

LOCATION:
Throughout body within
blood vessels & heart



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