

CONNECTIVE TISSUES

1 Sept 2016

(Jacob, et al., p. 85-90), Martini's 7th: 118-125, 8th: 124-143, 9th: 120-131, 10th: 126-140

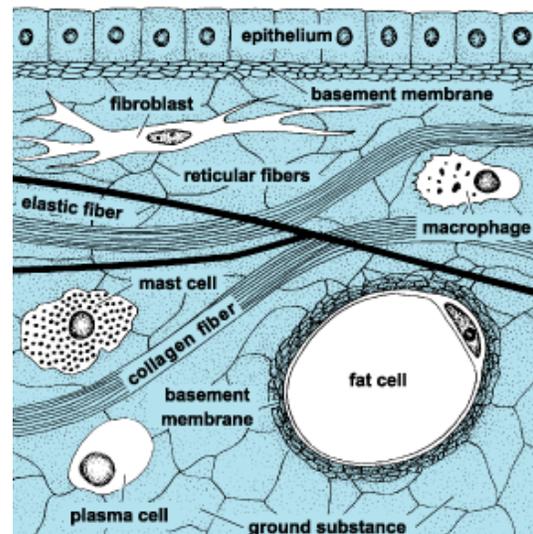
INTRODUCTION: (p 127)

Many Functions: support nourishment filler
storage defense "specialized" (blood)

CONNECTIVE TISSUE TRAITS:

Form: **dense** or **loose** C.T. superficial fascia or dermis
supporting C.T. Cartilage, bone, reticular (organ support)
fluid C.T. Blood, lymph

Composition: cells: **relatively few relative to volume**
intercellular matrix: **significant**, large amount of matrix
vascularity: loose: richly vascularized
cartilage, tendons: avascular



CELLS: (p 127, Fig 4-8):

fibroblasts most common cell in connective tissue, spin out protein fibers, etc. Capable of mitosis.
macrophages phagocytic cells, similar to monocytes, often fixed (part of **Reticular Endoplasmic System**, LEARN)
mast cells "Alarm cells", adjacent to blood vessels, manufacture histamine, heparin, etc, in cytoplasmic granules.
mesenchymal stem cells undifferentiated, esp. along vessels

MATRIX: ("mother") *Intercellular material:* types of connective tissue are differentiated in matrix composition.

- 1) **fibers embedded in ground substance**
- 2) **ground substance** semisolid gel

FIBERS (p. 128)

collagen "collagenous fibers" wavy, **strong & inelastic**, white, higher tensile strength than steel.
Subunit: tropocollagen, triple helix of single helices, rich in hydroxylated lysine and proline, giving stability.

elastin thread interwoven elastin **yellow** elastic fibers: found in stretchable tissues (arteries, etc.)

reticular short, branched, reticulum. Reticular constructed from types of tropocollagen, arranged in thin, delicate networks. abundant in loose connective. Reticular fibers not seen in histo. prep unless stained with silver.

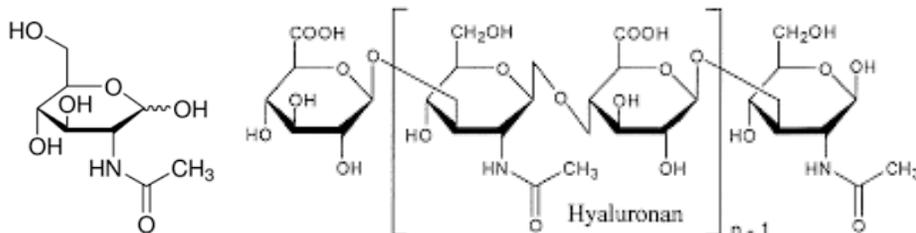
GROUND SUBSTANCE (glycoproteins = proteins with added modified carbohydrate side chains)

mucopolysaccharides: hyaluronic acid: polymer of (glucuronic acid β 1,3 N-acetylglucosamine).
may not be apparent (hyaline), often obvious (tendon)

Basement membrane is formed in part from reticular fibers, part from basal lamina.

hyaluronic acid:

N-acetyl glucose amine:



LOOSE CONNECTIVE TISSUE: fills space, penetrates organs, 3 types:

Areolar (130) (small spaces) **Most**

widespread connective tissue, all four types of cells found here. Basic to support organs, muscle, blood vessels, nerves. Attaches skin, holds organs, support vessels. Contains **large vol fluid**, carries nutrients, waste fr cells. **Edema here. ex: superficial fascia.**

Adipose (130) fat tissue, **signet ring** appearance, firm, resilient packing, fibroblasts filled, nucleus pushed to edge

Reticular (130) forms **framework of many organs:** lymphoid tissue, liver, bone marrow

DENSE CONNECTIVE TISSUE: Closely arranged tough collagen, elastic fibers.(p 132)

Regular **Collagenous** fibers predominate **all parallel**. Only cells are fibroblasts
Tendons, ligaments, aponeuroses, fascia (surrounds organs and muscles).

Irregular sturdier than loose **multidirectional fibers:** capsules, muscle sheaths, dermis

Elastic fibers are yellow, strong, elastic: walls of arteries, trachea, bronchi, vocal cords, etc.