

CONNECTIVE TISSUES

10/19/82, rvsd 5 Oct 95, 3 Oct 01, 7 Oct 02, 6 Oct 03, 4 Oct 04, 3 Oct 05, 6Oct08, 5Oct09
(Jacob, et al., p. 85-90), Martini's 5th: 118-124, 6th: 122-129, 7th: 118-125, 8th: 124-143

INTRODUCTION: (p 124)

Function: support nourishment filler
storage defense "specialized" (blood)

Connective tissue:

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

composition **cells:** **relatively few**
intercellular matrix **significant**, large amount of matrix
vascularity varies: loose is richly vascularized, cartilage, avascular

Cells: (p 125, Fig 4-8):

fibroblasts most common cell in connective tissue, spin out protein fibers, etc.
macrophages phagocytic cells, similar to monocytes, often fixed (part of RES)
mast cells adjacent to blood vessels, manufacture histamine, heparin.
mesenchymal undifferentiated stem cells, esp. along vessels

MATRIX: (intercellular material): **fibers** embedded in fluid to semisolid gel **ground substance**
matrix composition is the main difference between types of connective tissue.

FIBERS (p. 125)

collagen collagenous wavy, strong & inelastic, white. basic molecule: tropocollagen, triple helix of single helices. It is 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.
Not usually seen in histo. prep unless stained with silver.

GROUND SUBSTANCE (glycoproteins)

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

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

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

Areolar (125) (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 (128) fat tissue, **signet ring** appearance, firm, resilient packing, fibroblasts filled, nucleus pushed to edge

Reticular (128) forms **framework of many organs:** lymphoid tissue, liver, bone marrow

DENSE CONNECTIVE TISSUE: Closely arranged tough collagen, elastic fibers.(p 129)

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 **elastic**, yellow fibers, strong, elastic:
walls of arteries, trachea, bronchi, vocal cords, etc. (look yellow)