

Connective Tissue

- Connective tissue is one of the most abundant and widely distributed tissues in the body.

Connective tissue consists of two basic elements:

- 1) Extracellular matrix and
- 2) Cells.

Extracellular matrix is the material located between its widely spaced cells, and consists of protein *fibers* (embedded in the extracellular matrix between the cells: collagen fibers, elastic fibers, and reticular fibers) and *ground substance* (may be fluid, semifluid, gelatinous, or calcified). The extracellular fibers are secreted by the connective tissue cells and account for many of the functional properties of the tissue.

Connective tissue are arises from Embryonic cells '*mesenchymal cells*'. Each major type of connective tissue contains an *immature* class of cells with a name ending in *-blast*, which means "to bud or sprout." These immature cells are called *fibroblasts* in loose and dense connective tissue, *chondroblasts* in cartilage, and *osteoblasts* in bone. the *immature* cells differentiate into *mature cells* with names ending in *-cyte*, namely, **fibrocytes**, **chondrocytes**, and **osteocytes**.

Representative cells and fibers present in connective tissues

Reticular fibers

are made of collagen and glycoproteins. They provide support in blood vessel walls and form branching networks around various cells (fat, smooth muscle, nerve).

Fibroblasts

are large flat cells that move through connective tissue and secrete fibers and ground substance.

Collagen fibers

are strong, flexible bundles of the protein collagen, the most abundant protein in your body.

Macrophages

develop from monocytes and destroy bacteria and cell debris by phagocytosis.

Elastic fibers

are stretchable but strong fibers made of proteins, elastin, and fibrillin. They are found in skin, blood vessels, and lung tissue.

Adipocytes

are fat cells that store fats. They are found below the skin and around organs (heart, kidney).

Eosinophils

are white blood cells that migrate to sites of parasitic infection and allergic responses.

Neutrophils

are white blood cells that migrate to sites of infection that destroy microbes by phagocytosis.

Ground substance

is the material between cells and fibers. It is made of water and organic molecules (hyaluronic acid, chondroitin sulfate, glucosamine). It supports cells and fibers, binds them together, and provides a medium for exchanging substances between blood and cells.

Mast cells

are abundant along blood vessels. They produce histamine, which dilates small blood vessels during inflammation and kills bacteria.

Plasma cells

develop from B lymphocytes. They secrete antibodies that attack and neutralize foreign substances.

