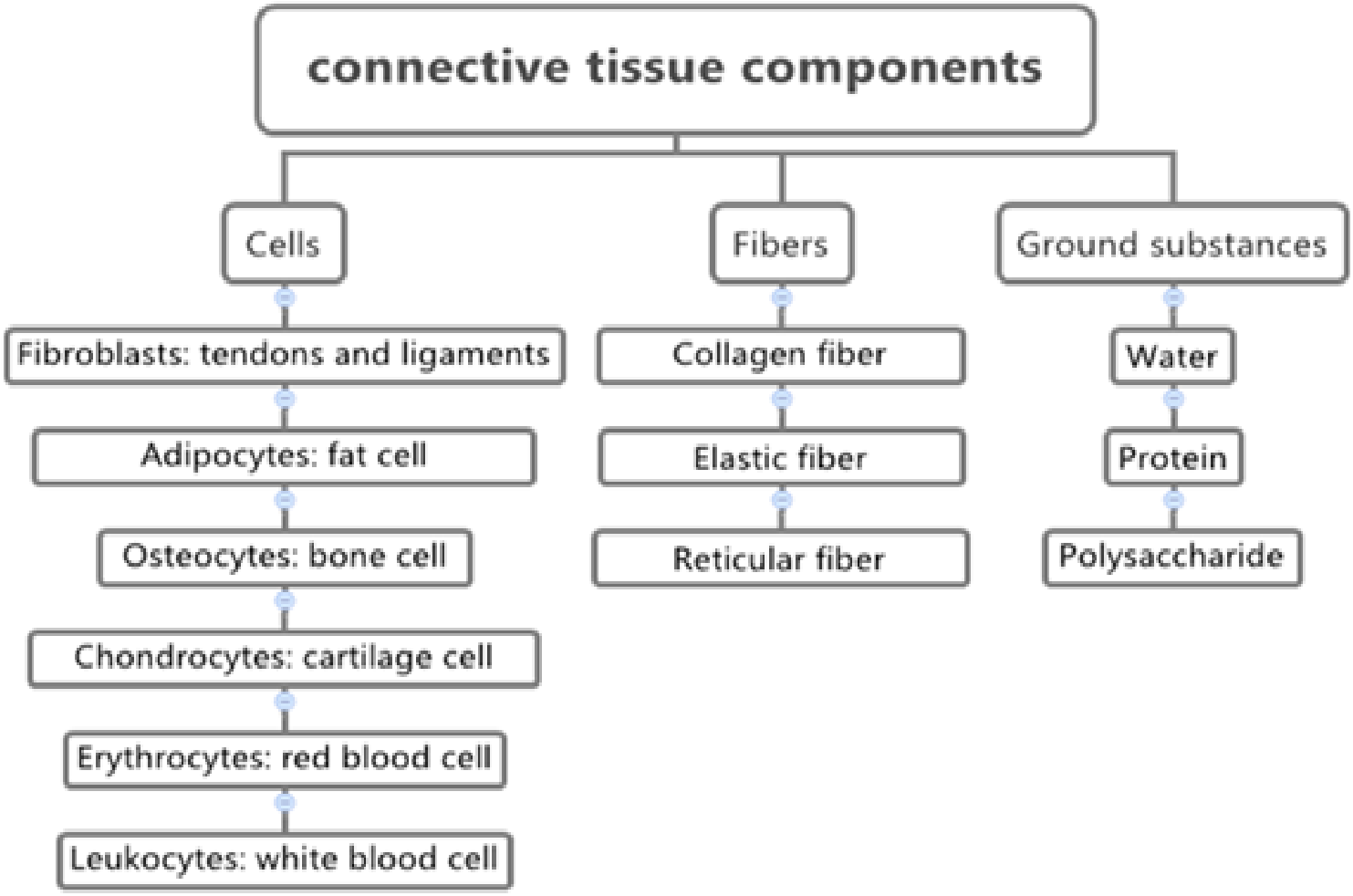
Connective Tissue

6th Lab

General characteristics of connective tissue:

1. **Connected body parts.**
2. **Found everywhere.**
3. **Most common type of tissue.**



1. The Cells

- **Fibroblasts: Secrete both fibers and ground substance of the matrix (wandering)**
- **Ligaments and tendons are soft collagenous tissues. Ligaments connect bone to bone, and tendons connect muscles to bone.**
- **Adipocytes: Fat cells that store triglycerides, support, protect, and insulate (fixed).**
- **Osteocyte: A branched cell embedded in the matrix of bone tissue.**

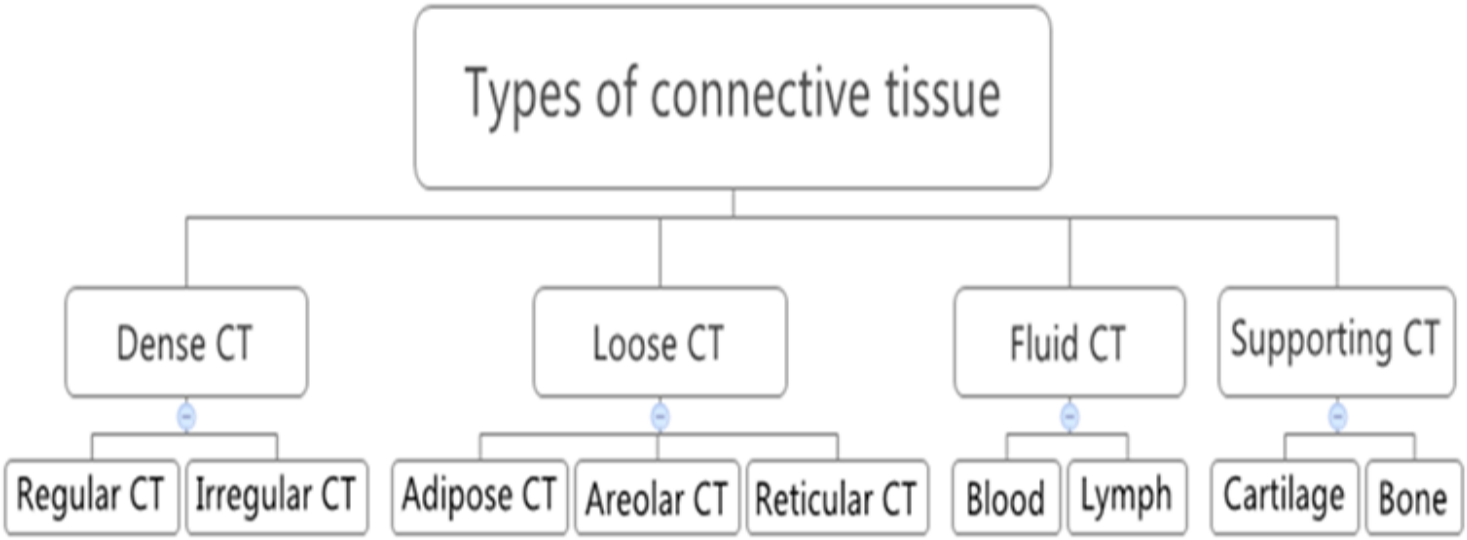
- **Chondrocyte: One of the cells embedded in the lacunae of the cartilage matrix.**
- **Erythrocyte / Red blood cell; corpuscle: One of the formed elements in peripheral blood. Normally, in humans, the mature form is a non-nucleated, yellowish, biconcave disk containing hemoglobin and transporting oxygen.**
- **Leukocyte / White blood cell: A colorless blood corpuscle capable of amoeboid movement, whose chief function is to protect the body against microorganisms causing disease and which may be classified into two main groups: granular and nongranular.**

2. **Matrix Fibers**

- **Collagen Fibers: Large fibers made of the protein collagen and are typically the most abundant fibers. Promote tissue flexibility.**
- **Elastic Fibers: Intermediate fibers made of the protein elastin. Branching fibers that allow for stretch and recoil.**
- **Reticular Fibers: Small, delicate, branched fibers that have same chemical composition of collagen. Forms structural framework for organs such as spleen and lymph nodes.**

3. **Matrix Ground Substance**

- **Hyaluronic Acid: Complex combination of polysaccharides and proteins found in "true" or proper connective tissue.**
- **Chondroitin sulfate: Jellylike ground substance of cartilage, bone, skin and blood vessels.**
- **Other ground Substances: Dermatin sulfate, keratin sulfate, and adhesion proteins.**

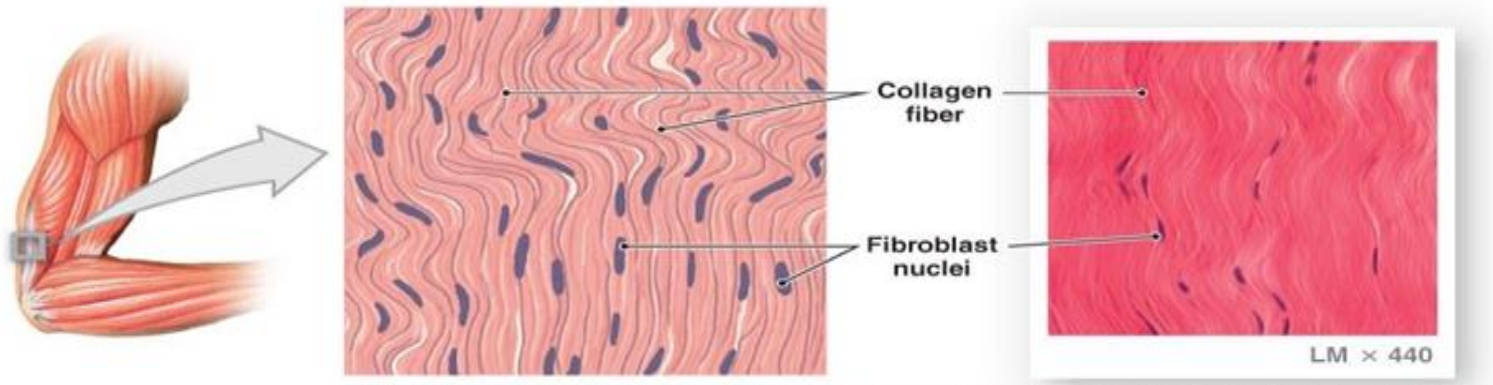


Types of connective tissue

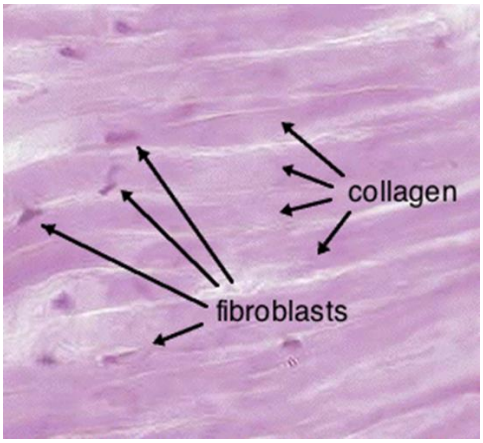
1. **Dense Connective Tissue: contains more numerous and thicker fibers and far fewer cells than loose CT.**

A. Dense regular connective tissue (Tendons and ligaments).

- **Consists of bundles of collagen fibers and fibroblasts forms tendons, ligaments and aponeuroses.**
- **Function: provide strong attachment between various structures.**

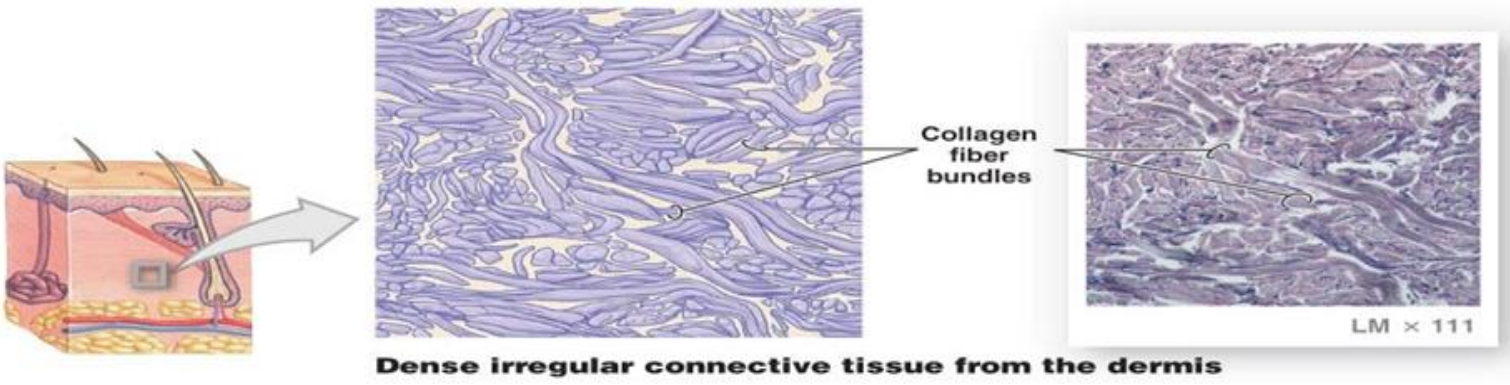


Dense regular connective tissue in a tendon from the triceps muscle

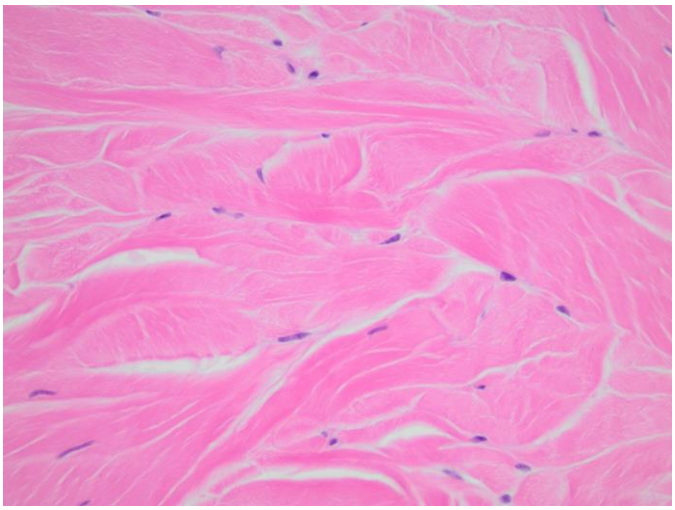


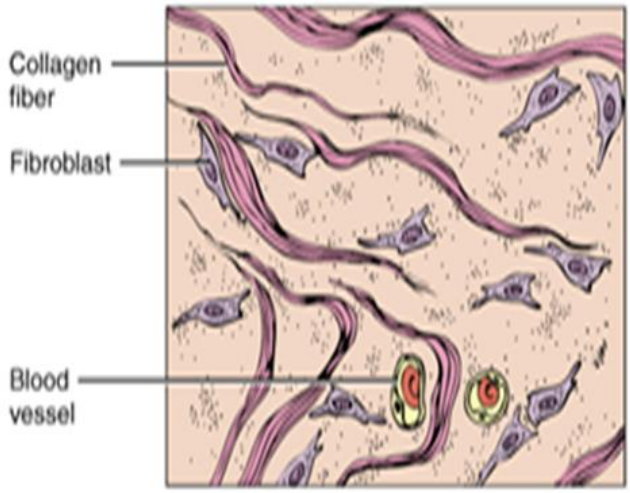
B. Dense Irregular connective tissue (Dermis of skin, submucosa of digestive tract).

- **Consists of randomly-arranged collagen fibers and a few fibroblasts.**
- **Found in fasciae, dermis of skin, joint capsules, and heart valves.**
- **Function: provide strength.**



Dense irregular connective tissue from the dermis

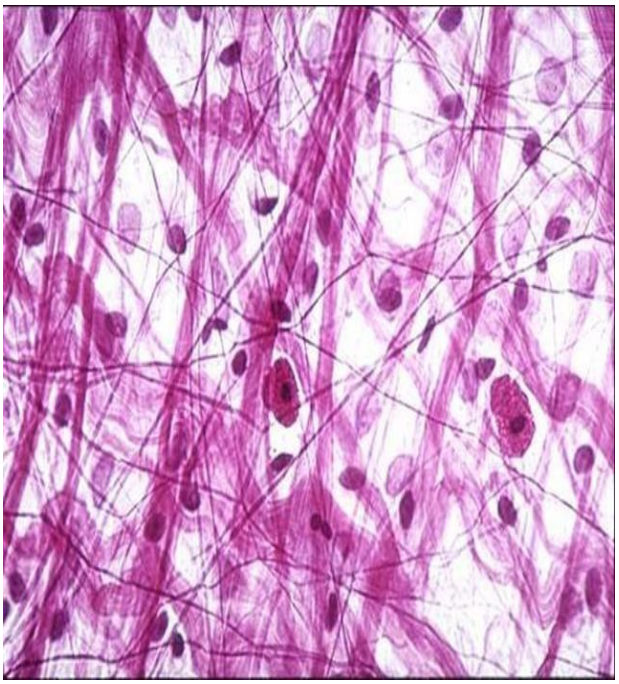


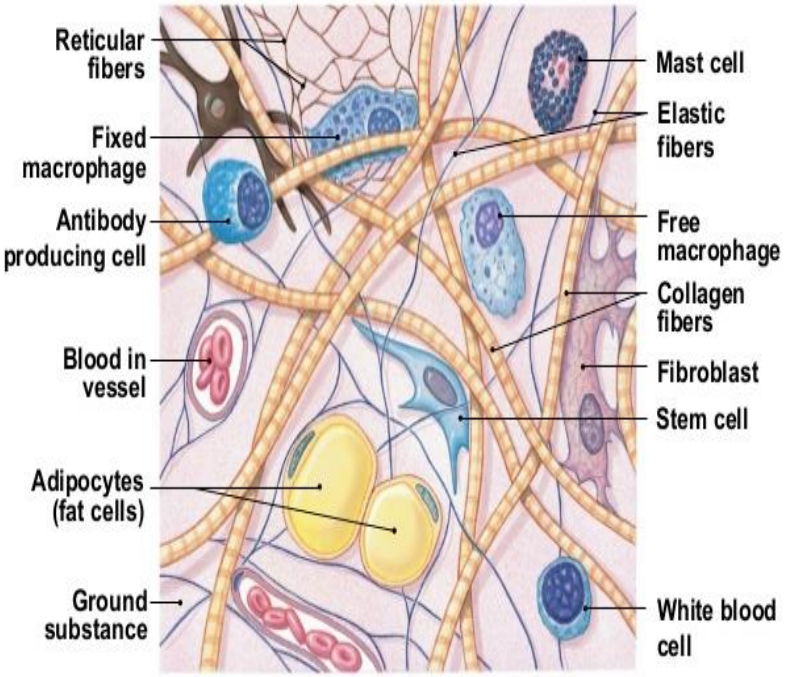


2. Loose Connective Tissue:

A. Areolar connective tissue: Widely distributed under epithelia.

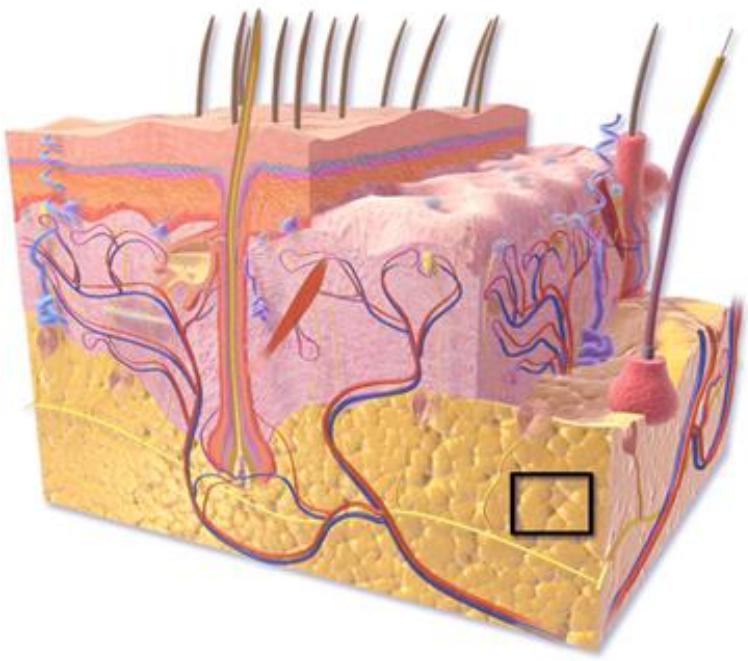
- **Consists of all three types of fibers, several types of cells, and semi-fluid ground substance.**
- **Found in subcutaneous layer and mucous membranes, and around blood vessels, nerves and organs.**
- **Function: strength, support and elasticity.**

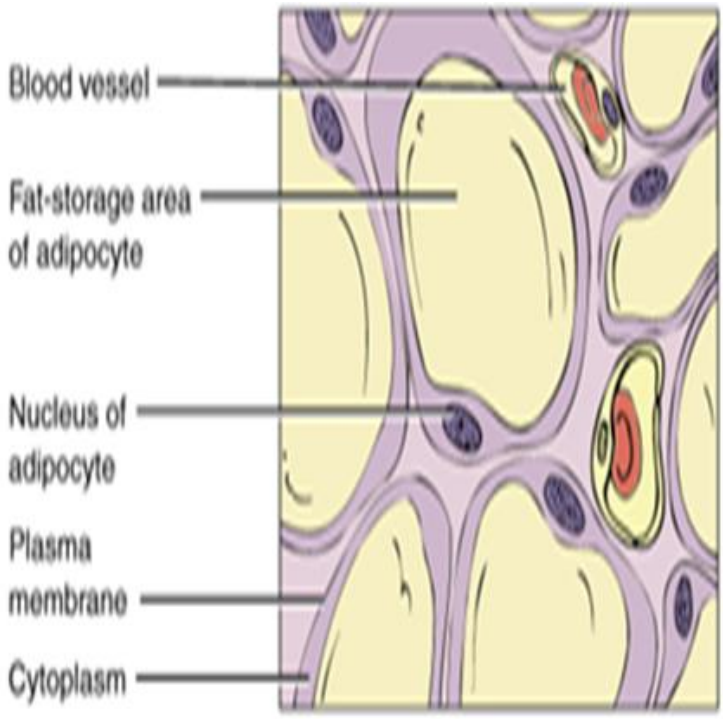


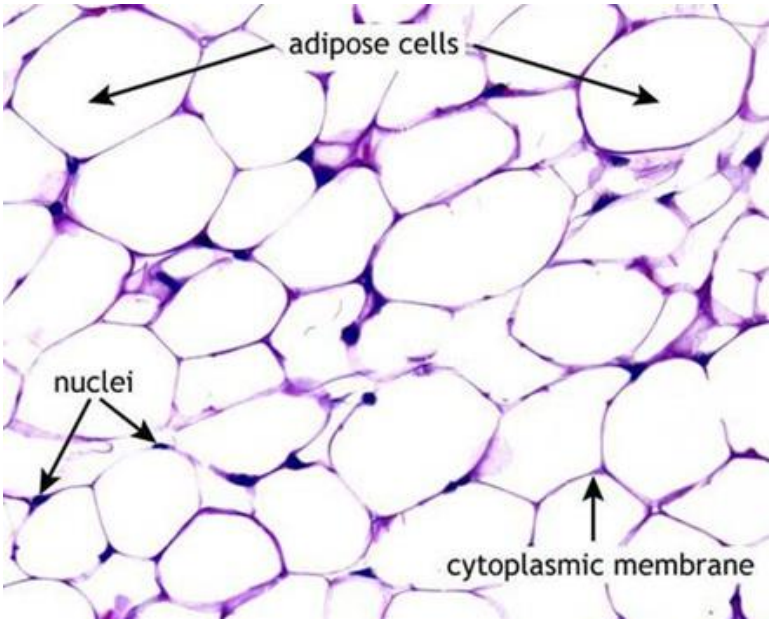


B. Adipose tissue: **Hypodermis, within abdomen and breasts.**

- **consists of adipocytes; "signet ring" appearing fat cells. They store energy in the form of triglycerides (lipids).**
- **Found in subcutaneous layer, around organs and in the yellow marrow of long bones**
- **Function: supports, protects and insulates, and serves as an energy reserve.**







C. Reticular connective tissue: Lymphoid organs such as lymph nodes

- **Consists of fine interlacing reticular fibers and reticular cells.**
- **Found in liver, spleen and lymph nodes.**
- **Function: forms the framework (stroma) of organs and binds together smooth muscle tissue cells.**