SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF OPERATION THEATRE AND ANESTHESIA TECHNOLOGY

COURSE NAME : 1131 - BASIC SCIENCES - ANATOMY

UNIT : 1 BASICS OF ANATOMY

TOPICS : CONNECTIVE TISSUES

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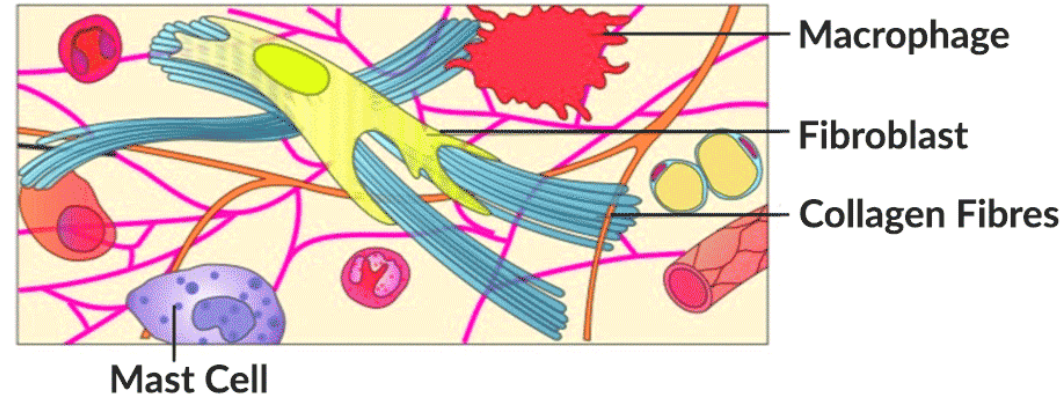
INTRODUCTION (Define)

- It is the most abundant and widely distributed tissue in the body.
- **Primary function**: to connect, bind, support, protect, insulate, and transport substances.
- They are characterized by **abundant extracellular material (matrix) and relatively few cells.**
- All connective tissues (except blood) originate from embryonic mesenchyme (derived from mesoderm).



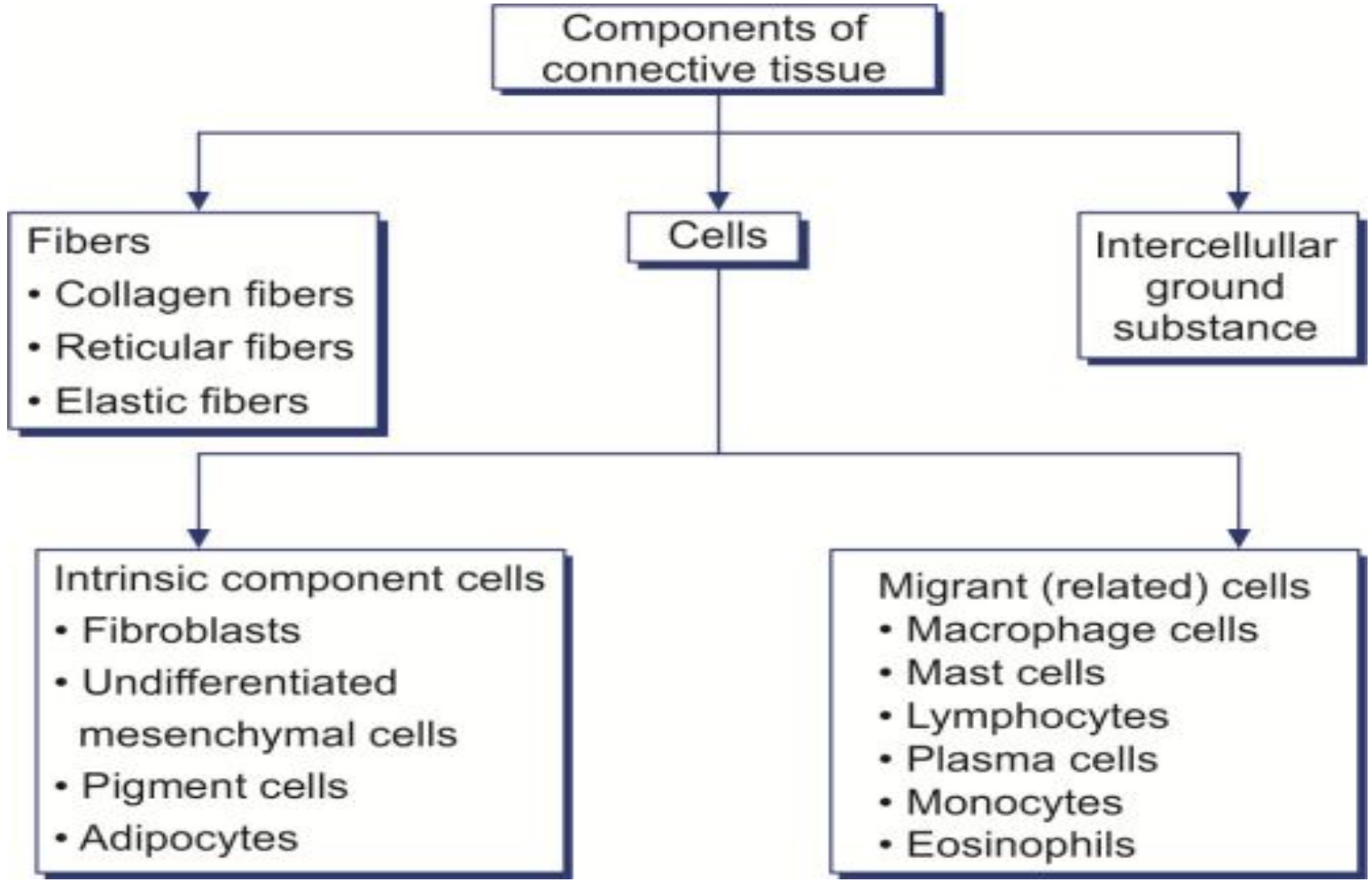
CHARACTERISTICS

- Cells are **scattered** (not in contact with each other like epithelium).
- **Large amount of extracellular matrix** (ECM) between cells. It consists of:
  - ❑ Ground substance (gel-like material; proteoglycans, glycosaminoglycans, water)
  - ❑ Protein fibers (collagen, elastic, reticular)
- Usually **highly vascular,** except cartilage (avascular) and tendons/ligaments (poorly vascular).
- **Innervated** (except cartilage, which has no nerves).
- Varying degrees of **rigidity/flexibility** depending on the type.

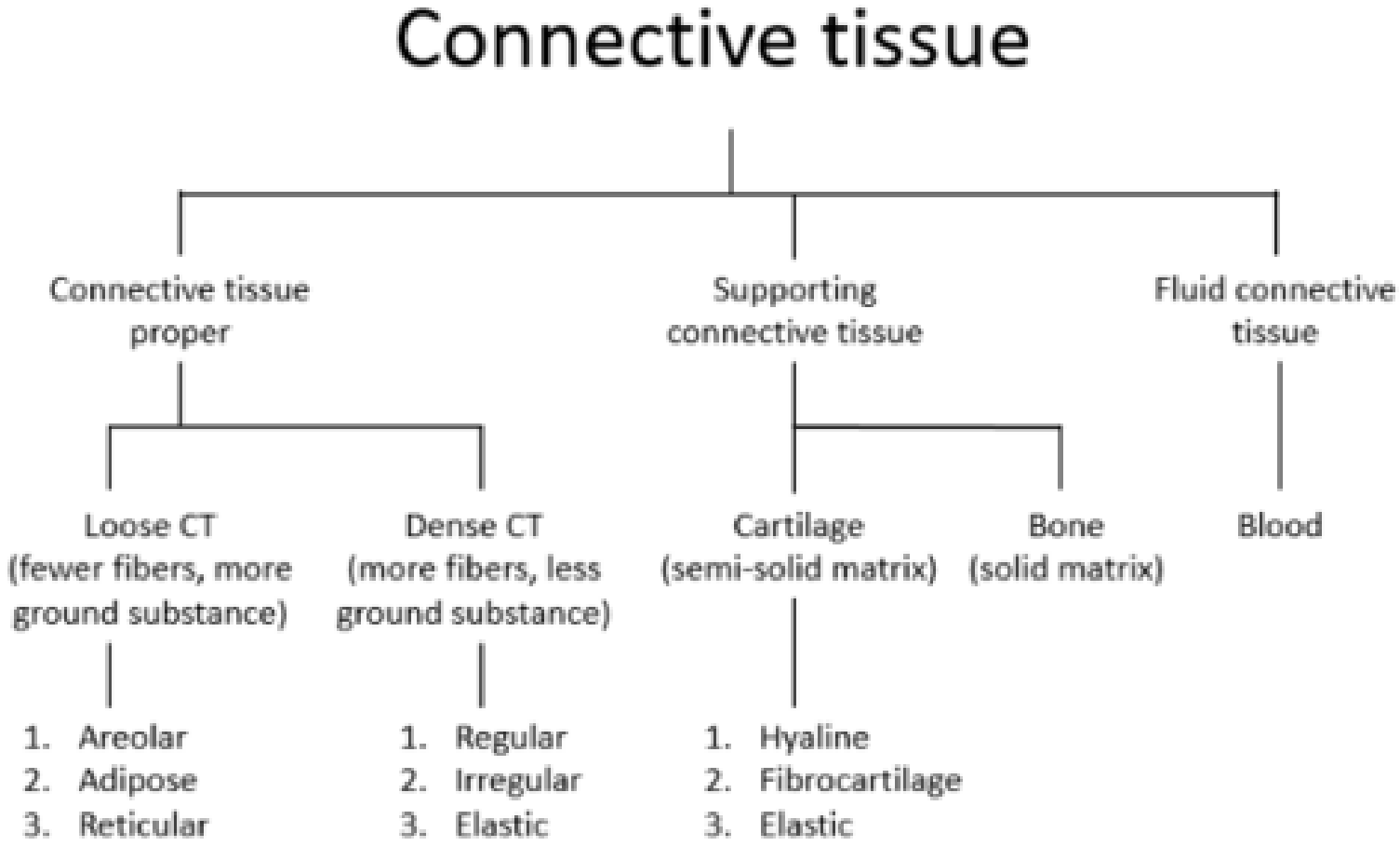
FUNCTIONS

- Structural support and framework (bones, cartilage).
- Binding and anchoring of organs (tendons, ligaments, adipose).
- Protection of delicate organs (bone, adipose padding).
- Storage of energy reserves (adipose tissue).
- Transport of substances (blood).
- Immune defense (macrophages, plasma cells, mast cells, etc. in loose CT).
- Repair and wound healing (fibroblasts produce collagen).

COMPONENTS


Components of connective tissue
Fibers
• Collagen fibers
• Reticular fibers
• Elastic fibers
Cells
Intercellullar ground substance
Intrinsic component cells
• Fibroblasts
• Undifferentiated mesenchymal cells
• Pigment cells
• Adipocytes
Migrant (related) cells
• Macrophage cells
• Mast cells
• Lymphocytes
• Plasma cells
• Monocytes
• Eosinophils

CLASSIFICATION



LOOSE CONNECTIVE TISSUES

AREOLAR TISSUE

- Under Epithelia of body
- Wrap & cushing organs

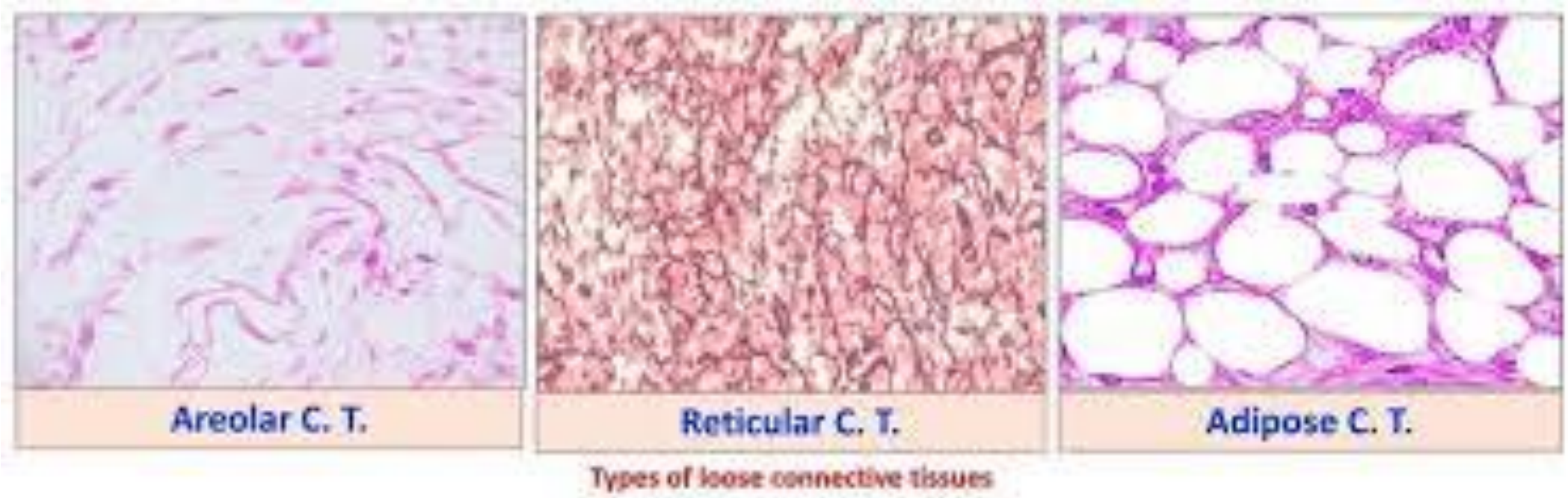
ADIPOSE TISSUE

- Under skin
- Supports & protects organs

RETICULAR TISSUE

- Lymphoid organs
- Supports other cell types

LOOSE CONNECTIVE TISSUES



Types of loose connective tissues

DENSE CONNECTIVE TISSUES

DENSE REGULAR TISSUE

- Tendons & ligament
- Attach muscles to bone or to muscles

DENSE IRREGULAR TISSUE

- Dermis of skin
- Provides structural strength

ELASTIC TISSUE

- Arteries
- Allows recoil of tissues following stertching

DENSE CONNECTIVE TISSUES

Types of dense connective tissues

CARTILAGE

HYALINE CARTILAGE

- Trachea, nose
- Supports & reinforces

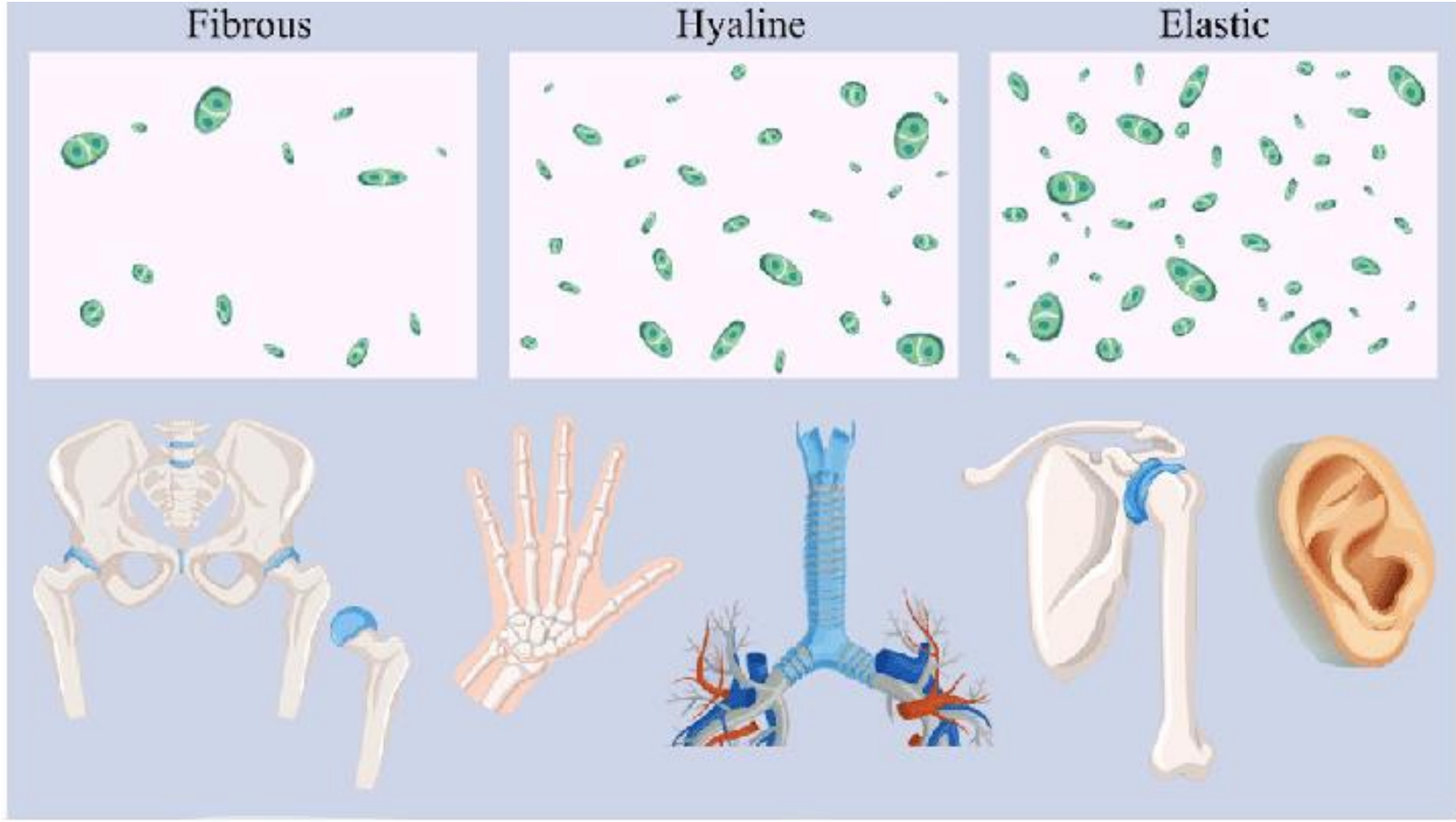
ELASTIC CARTILAGE

- External ear
- Maintain shape

FIBRO CARTILAGE

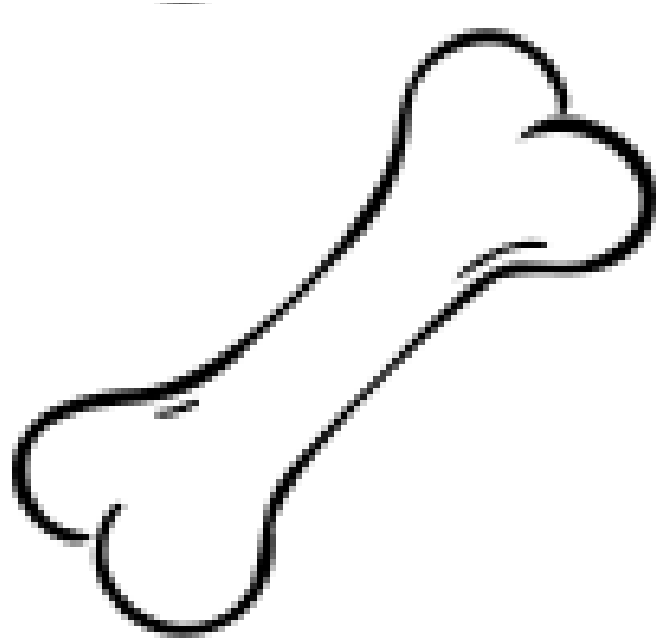
- Intervertebral discs
- Ability to absorb compression shock

CARTILAGE



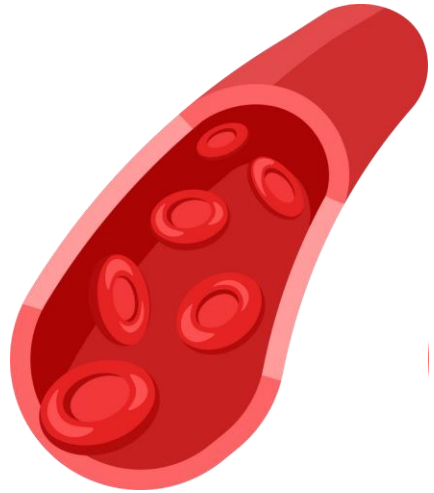
BONE

- It is a rigid organ that forms part of the skeleton of vertebrates, serving as a rigid body tissue made of cells embedded in an abundant mineralized intercellular material
- Supports & protection



BLOOD

- It is a specialized fluid connective tissue that circulates throughout the body via the vascular system
- Transport respiratory gases



SUMMARY

- Connective tissue is the most abundant tissue, derived from mesoderm, characterized by scattered cells and abundant extracellular matrix (ground substance + fibres).
- It binds, supports, protects, stores energy, transports substances, and helps in defence and repair.
- Classified into loose CT (areolar, adipose, reticular), dense CT (regular, irregular, elastic), cartilage (hyaline, elastic, fibrocartilage), bone, and blood.

REFERENCE

Book:

- Ross & Wilson Anatomy and Physiology in Health and Illness

Websites:

- https://www.kenhub.com/en/library/anatomy/connective-tissue
- https://www.ncbi.nlm.nih.gov/books/NBK538534/

THANK YOU