The Practical LAB of Human Histology
Connective Tissue

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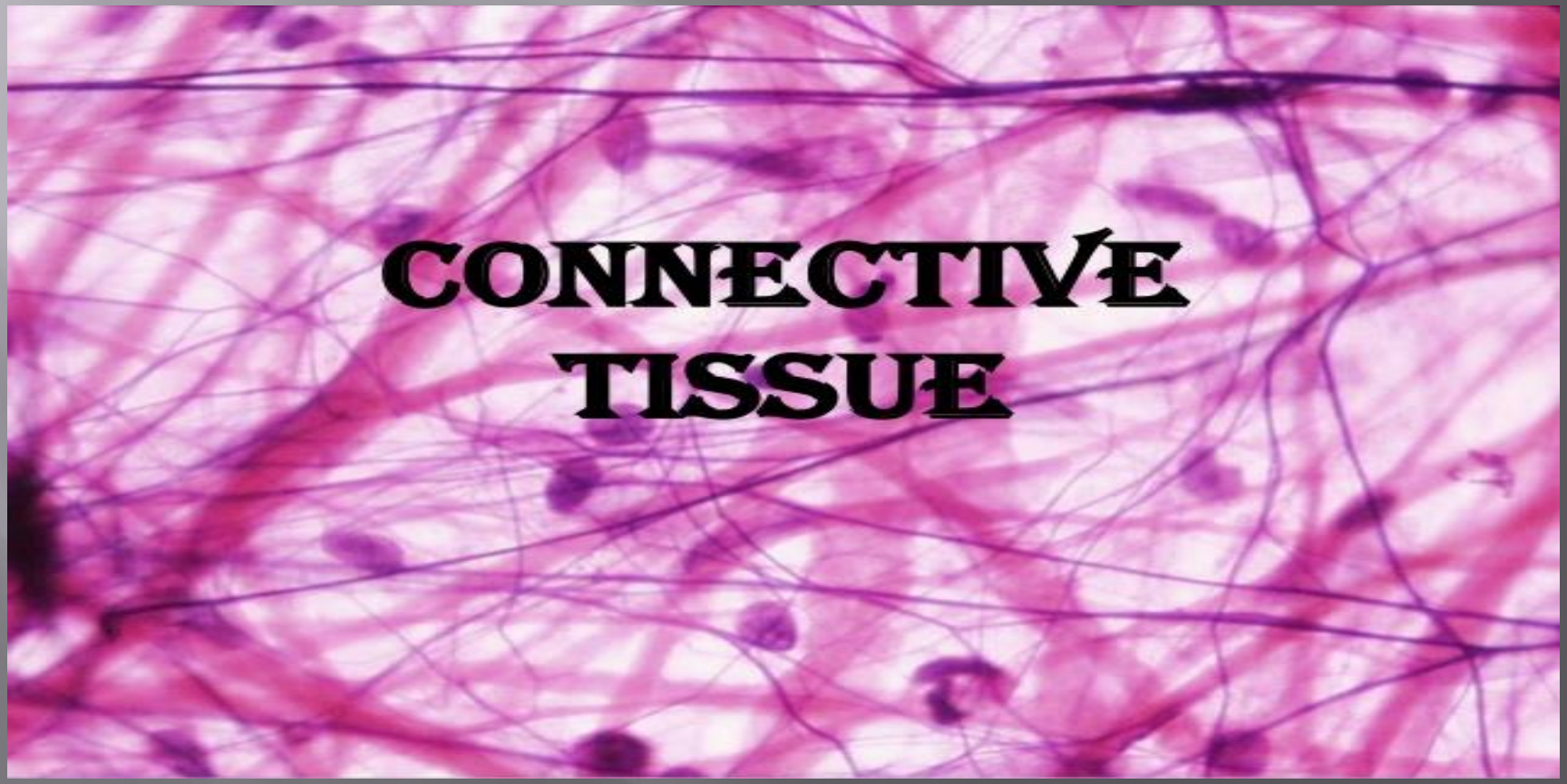


Why do you learn histology

Objectives

To understand

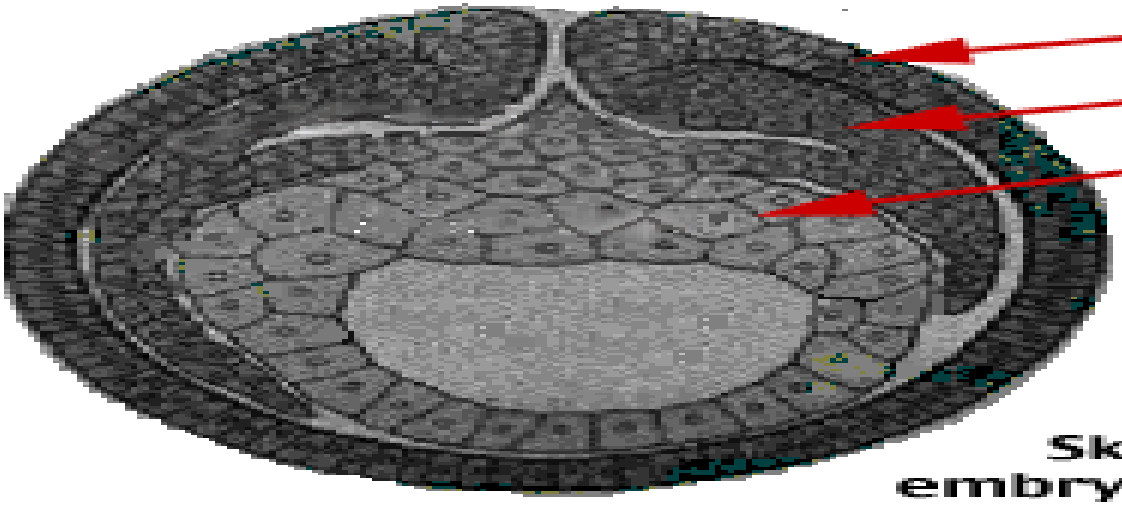
- How cells and tissues are arranged in the normal organ system of the body,

and

- How these cells and tissues are specialized to perform the functions (structure-function relationship) most effectively.

Embryonic Tissue

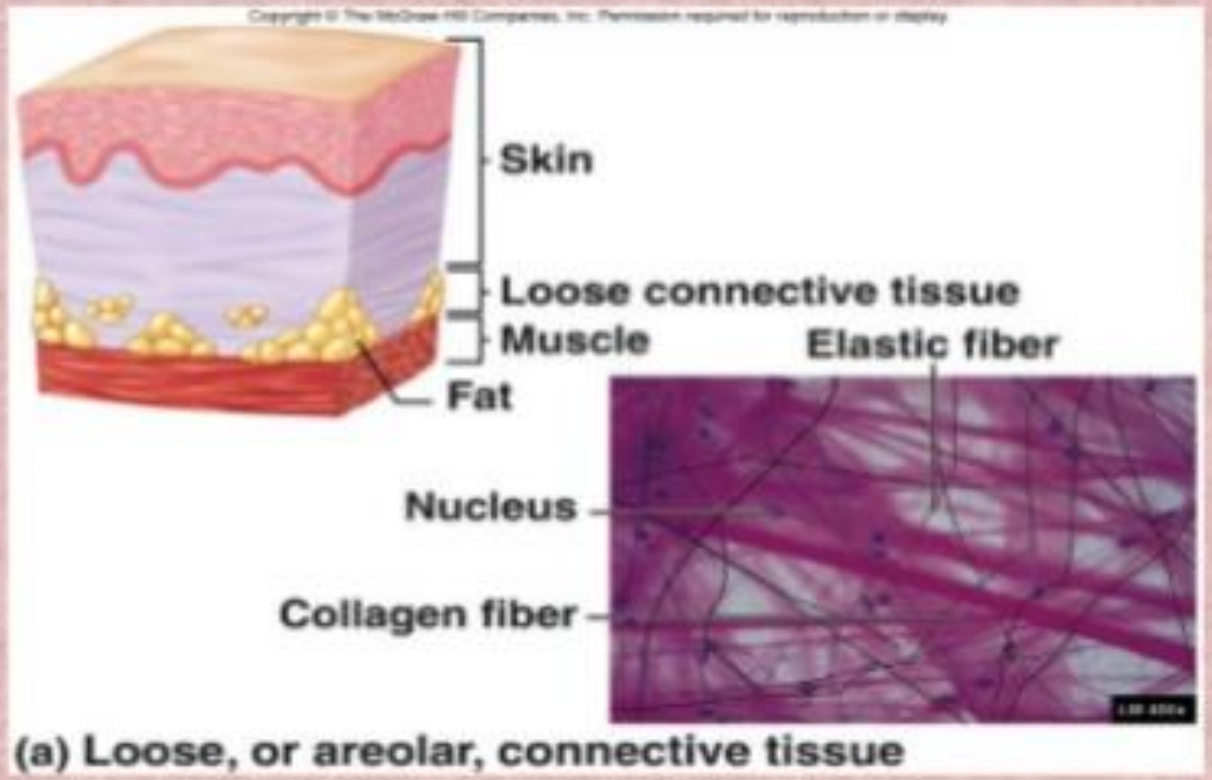
- **Germ layers**
  - Endoderm
    - Inner layer
    - Forms lining of digestive tract and derivatives
  - Mesoderm
    - Middle layer
    - Forms tissues as muscle, bone, blood vessels
  - Ectoderm
    - Outer layer
    - Forms skin and neuroectoderm



Sketch of the three embryonic germ layers

Functions of Connective Tissue

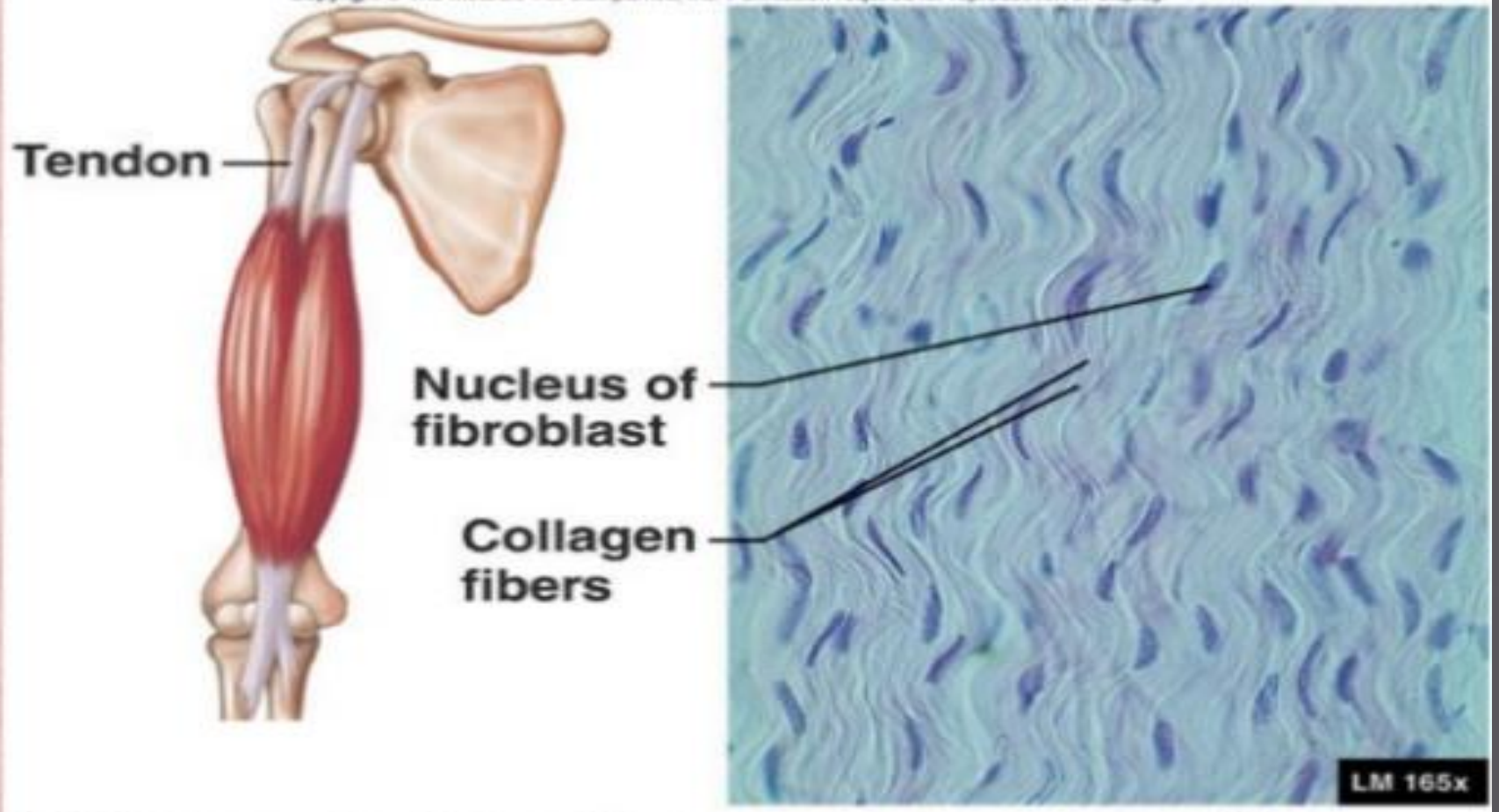
- Enclosing and separating as capsules around organs
- Connecting tissues to one another as tendons and ligaments
- Supporting and moving as bones
- Storing as fat
- Cushioning and insulating as fat
- Transporting as blood
- Protecting as cells of the immune system



(a) Loose, or areolar, connective tissue

- Also known as areolar tissue
- Loose packing material of most organs and tissues
- Attaches skin to underlying tissues
- Contains collagen, reticular, elastic fibers and variety of cells

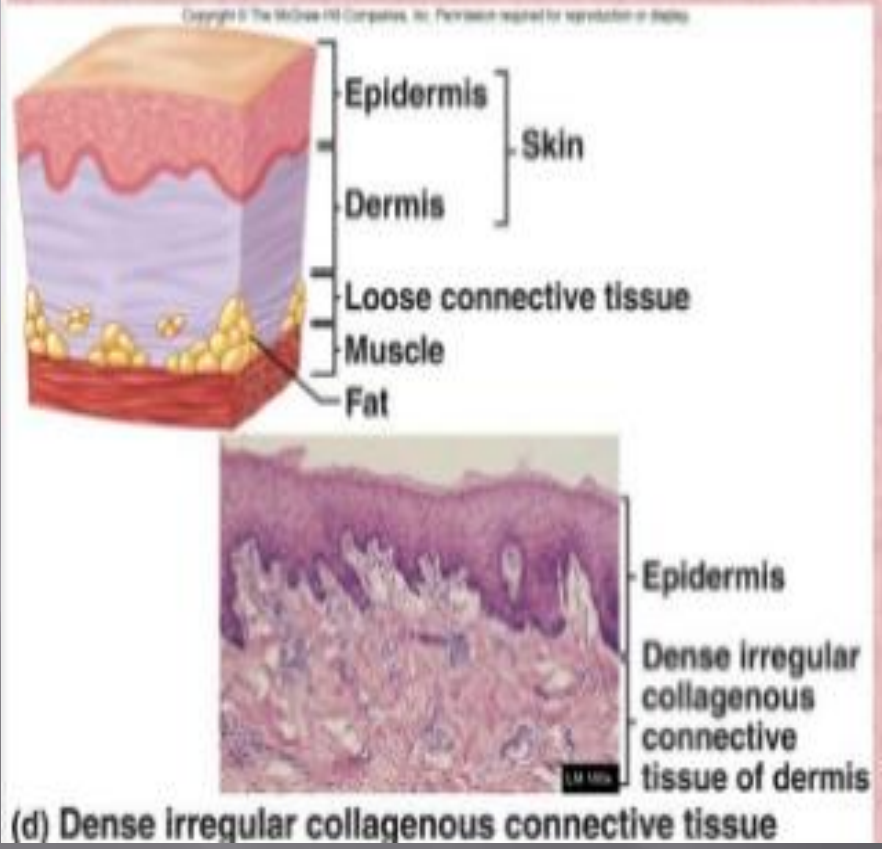
Dense Regular Connective Tissue



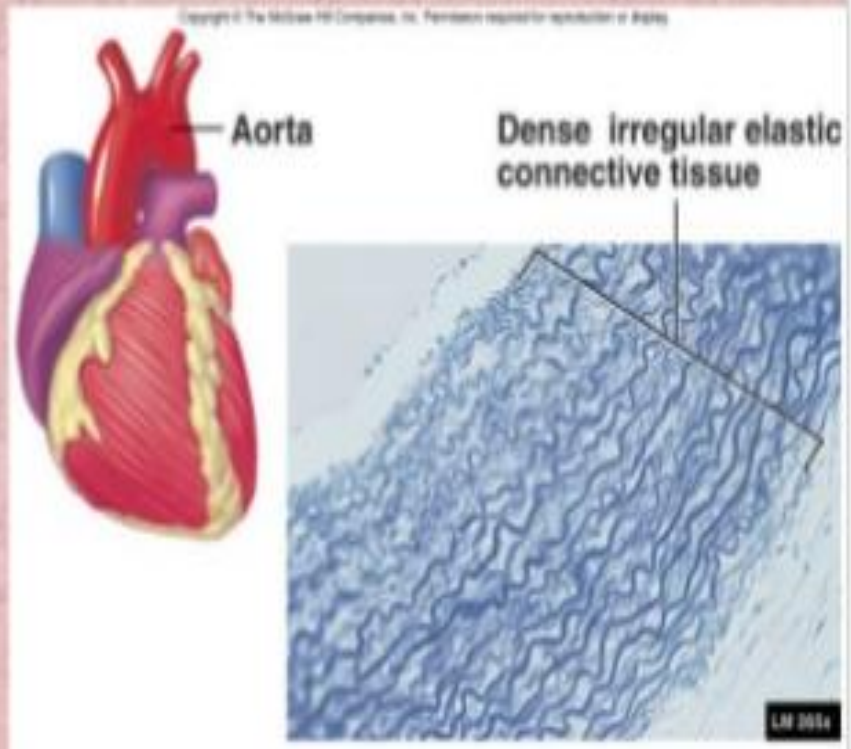
(b) Dense regular collagenous connective tissue

Dense Irregular Connective Tis

Clip slide

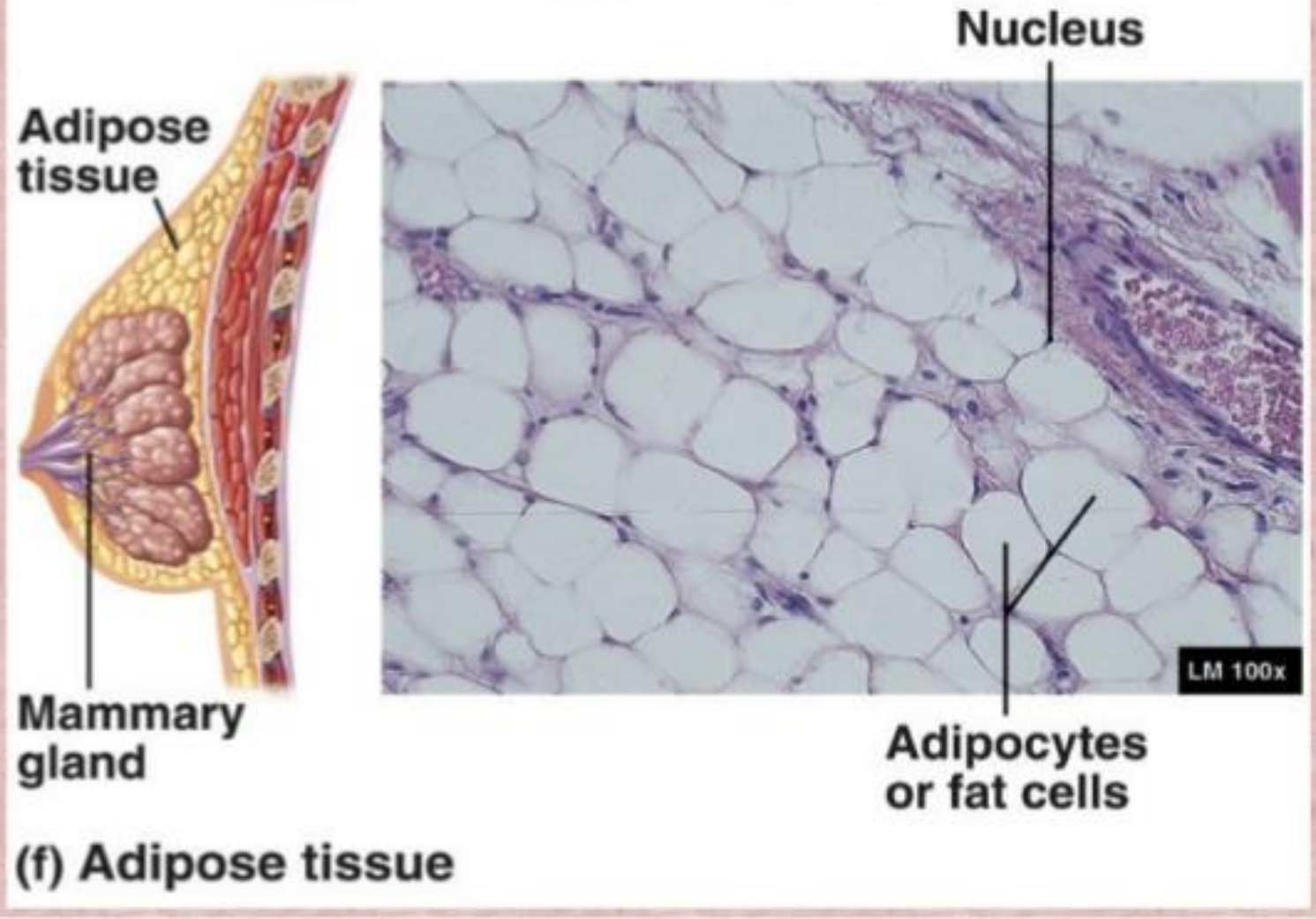


(d) Dense irregular collagenous connective tissue

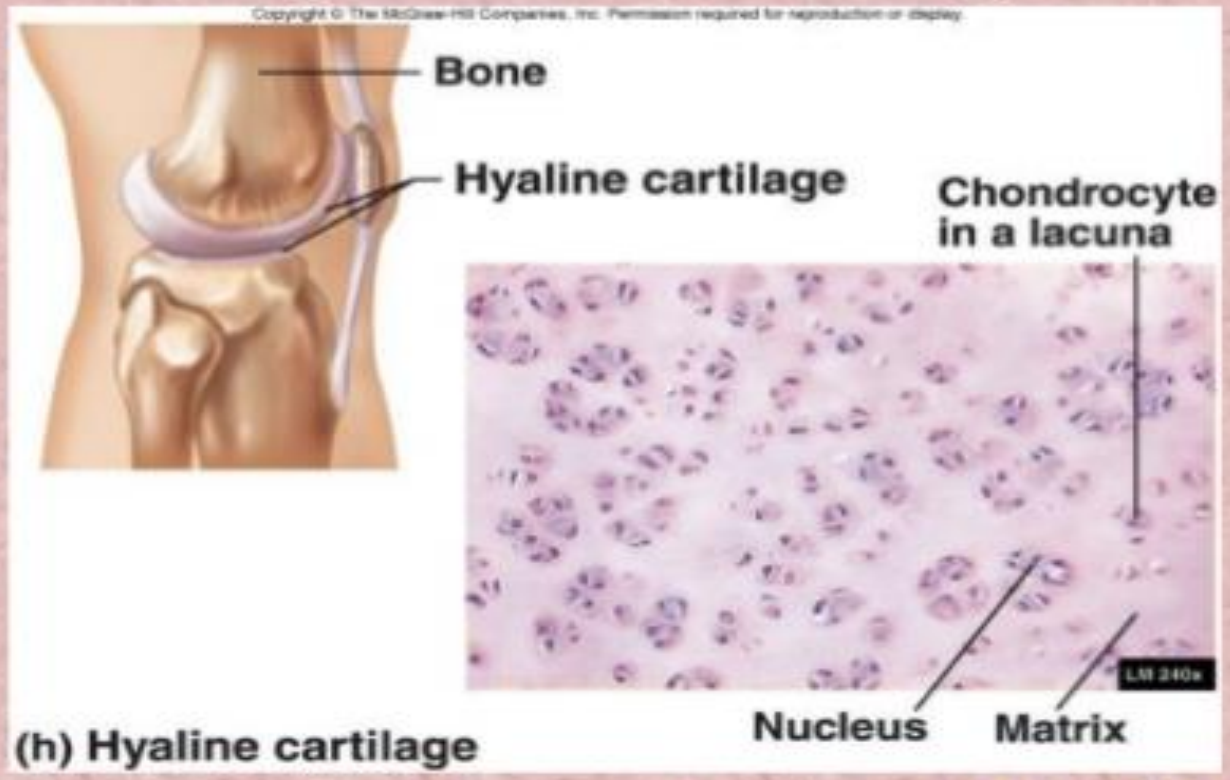


(e) Dense irregular elastic connective tissue

Adipose Tissue

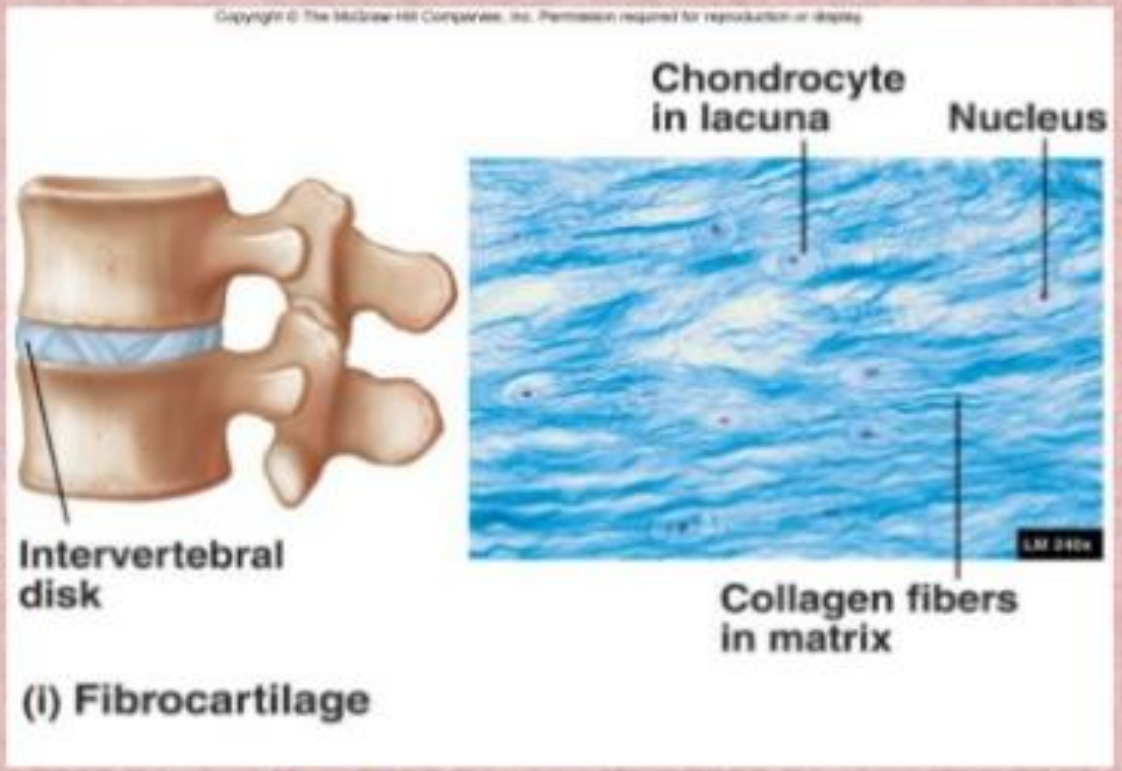


Hyaline Cartilage



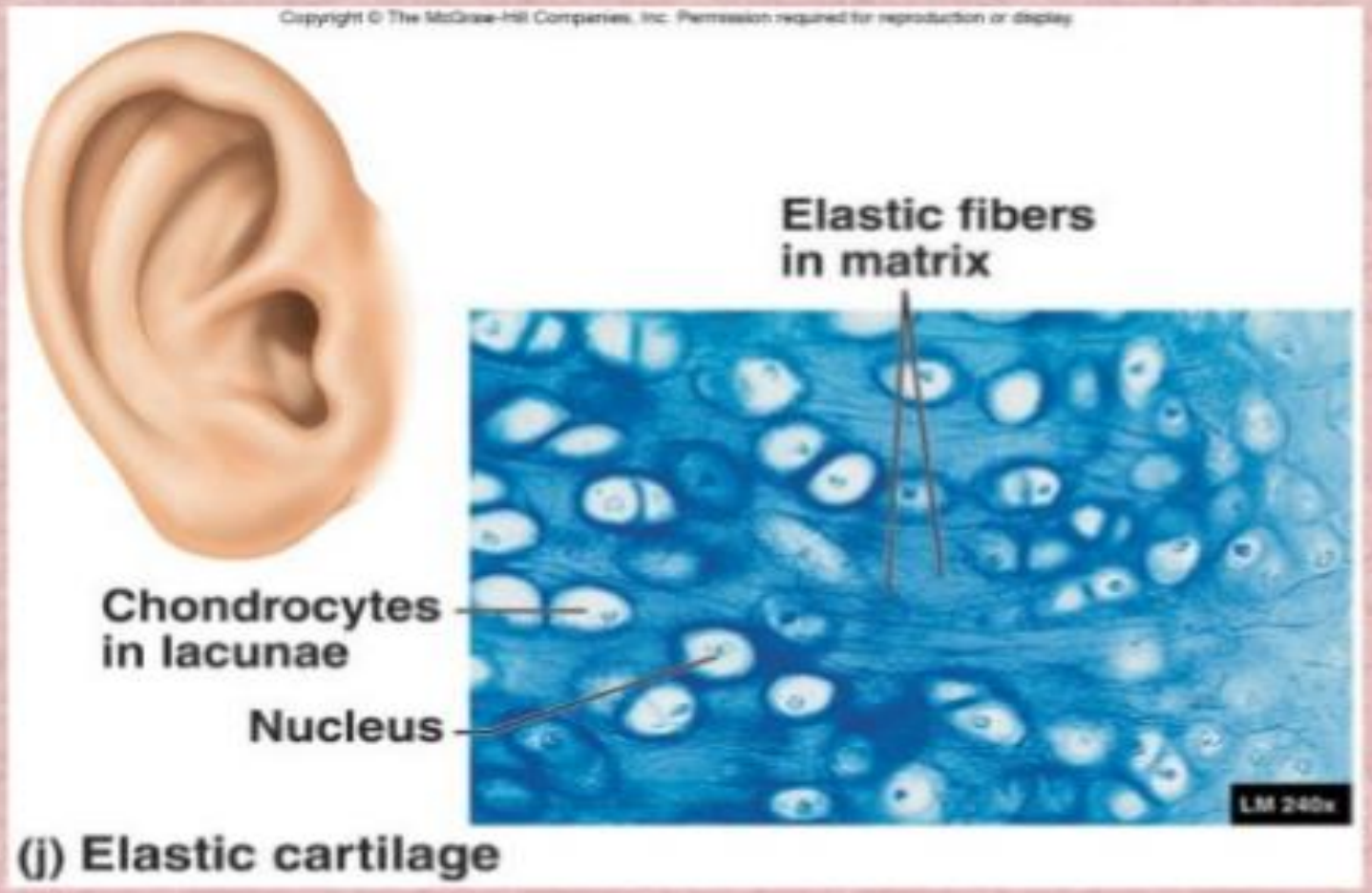
- Found in areas for strong support and some flexibility
  - Rib cage and cartilage in trachea and bronchi
- Forms most of skeleton before replaced by bone in embryo
- Involved in growth that increases bone length

Fibrocartilage



- Slightly compressible and very tough
- Found in areas of body where a great deal of pressure is applied to joints
  - Knee, jaw, between vertebrae

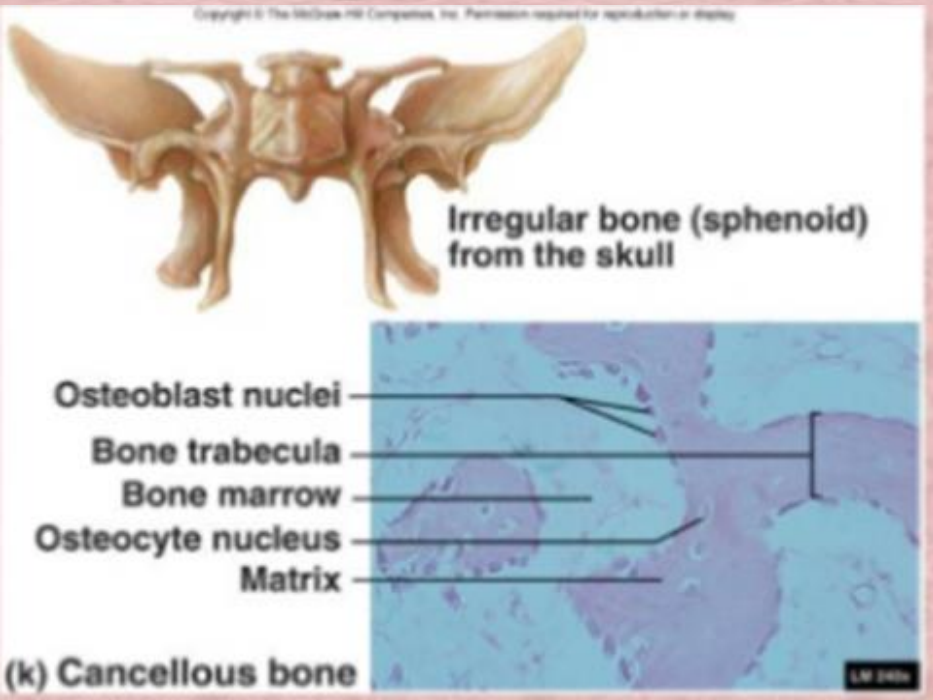
Elastic Cartilage

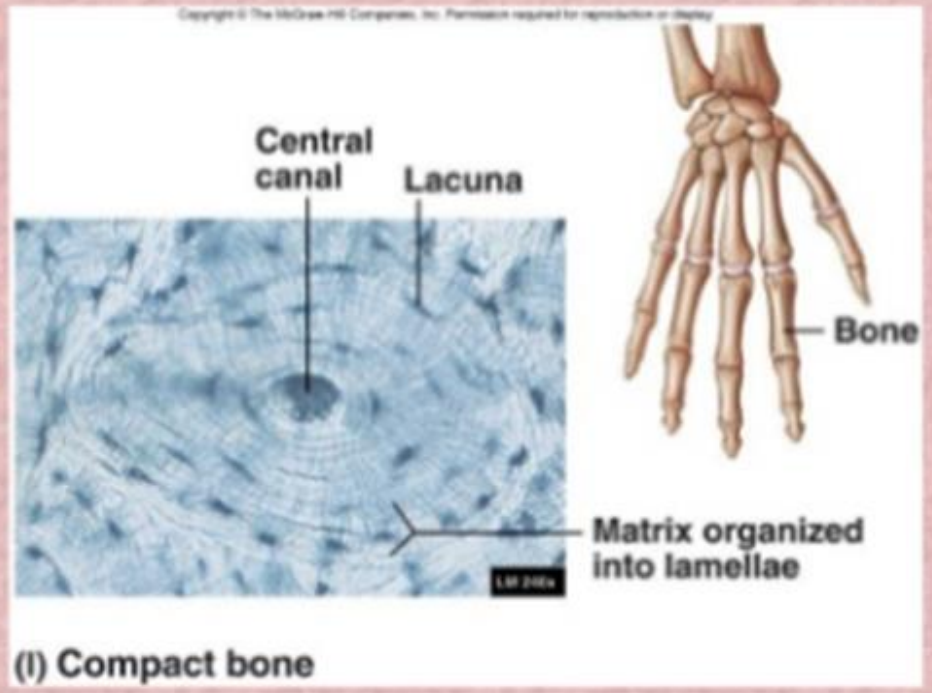


- Rigid but elastic properties
  - External ears, epiglottis

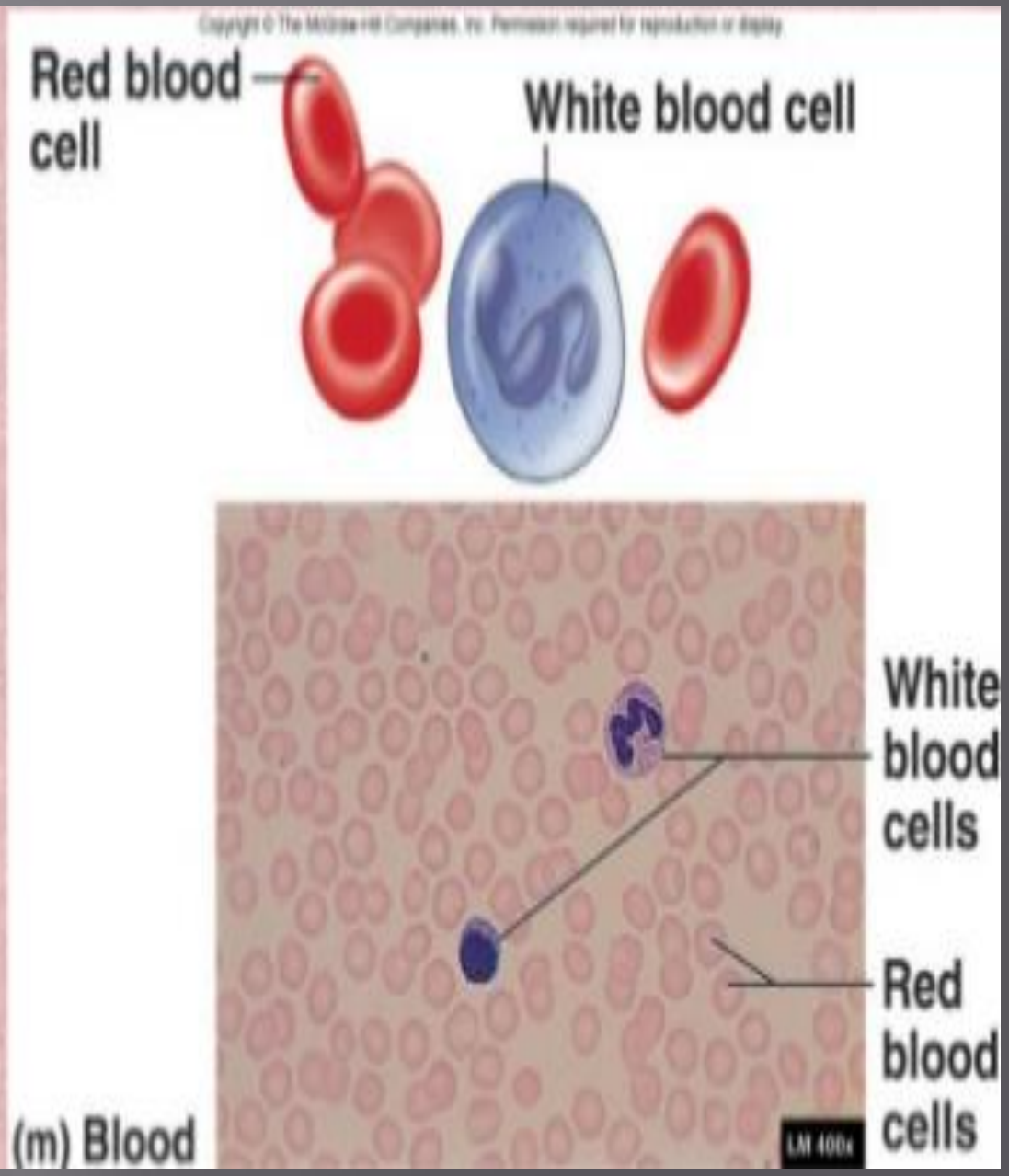
Bone

- Hard connective tissue that consists of living cells and mineralized matrix
- Organic and inorganic
- Types
  - Cancellous or spongy bone
  - Compact bone

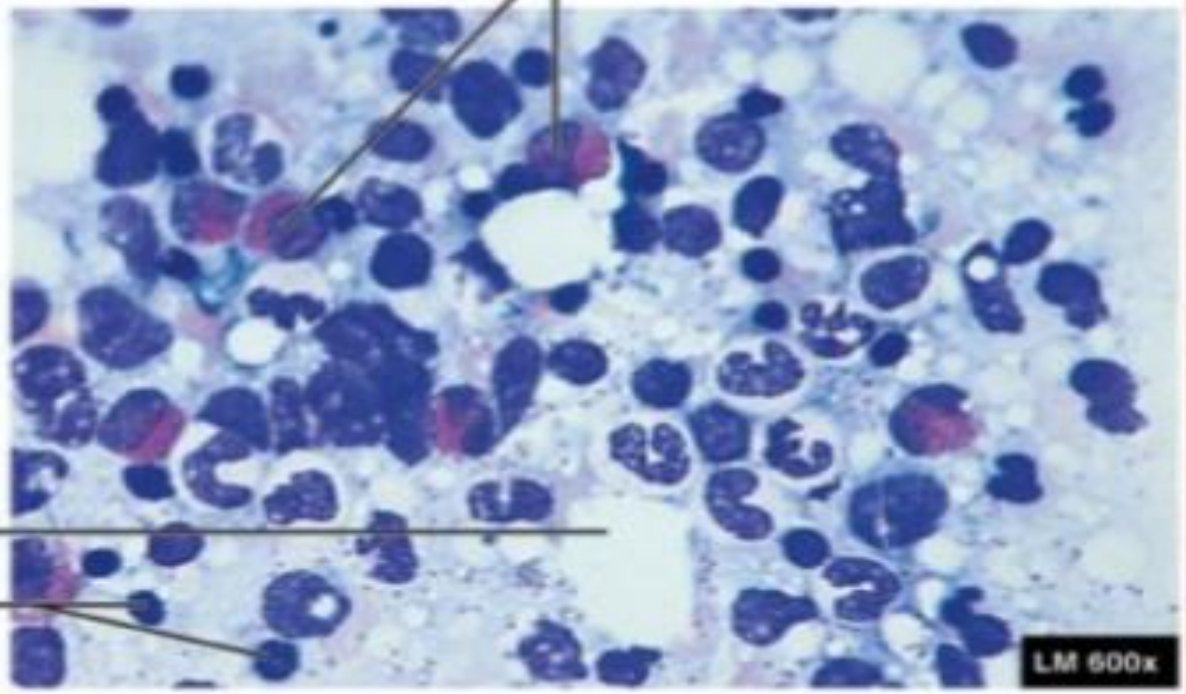




- Matrix between the cells is liquid
- Hemopoietic tissue
  - Forms blood cells
  - Found in bone marrow
    - Yellow
    - Red

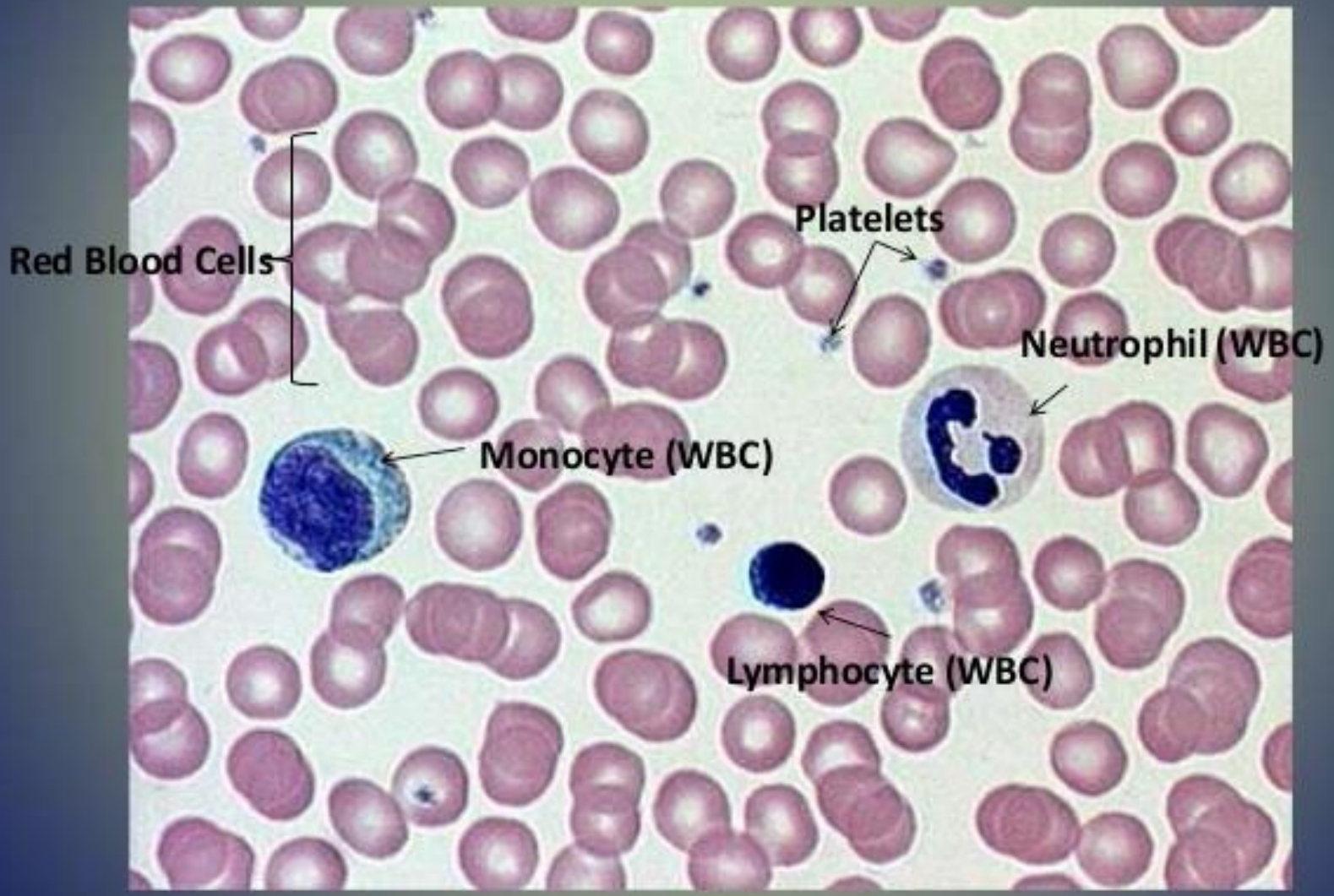


Bone Marrow



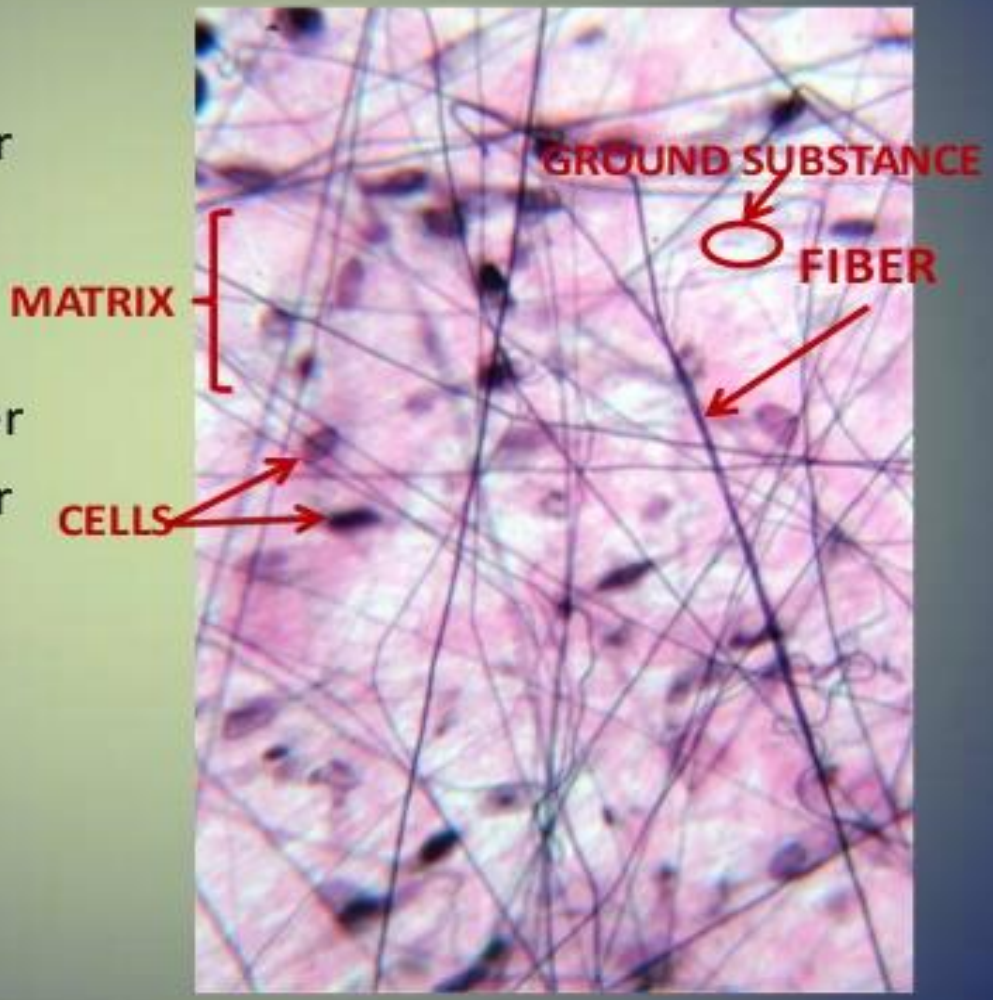
(n) Bone marrow

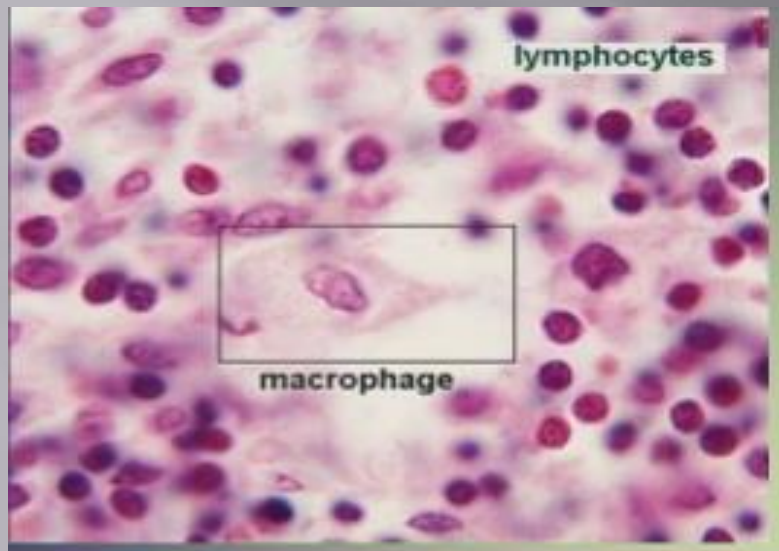
Blood & Lymph

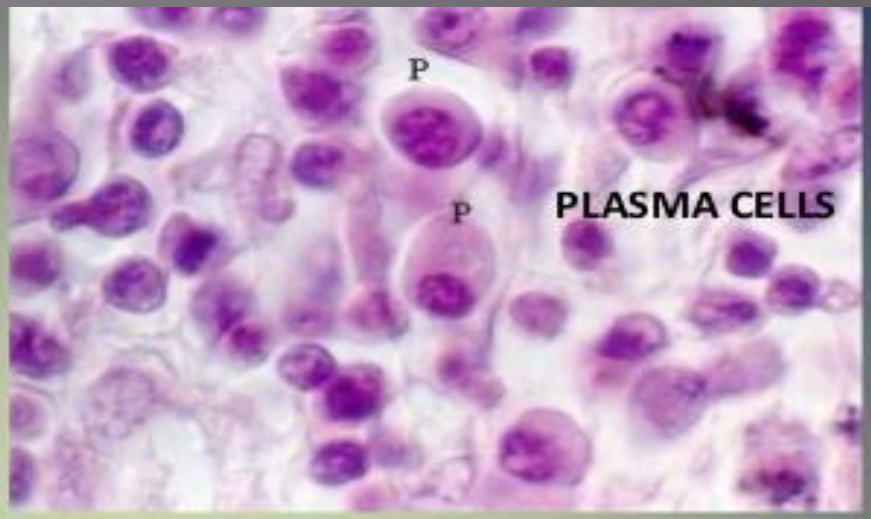

Red Blood Cells
Platelets
Neutrophil (WBC)
Monocyte (WBC)
Lymphocyte (WBC)

Two Main Components

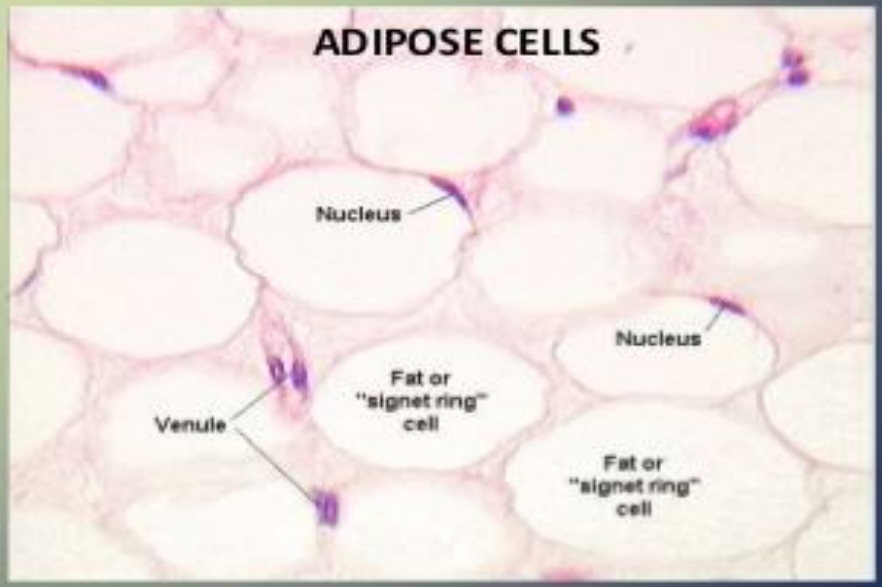
- **Extra cellular matrix**
  - Consist of protein fiber and ground substance
- **Cells**
  - Cells not usually touching each other
  - Lots of extracellular matrix
  - Well vascularized




lymphocytes
macrophage


P
P
PLASMA CELLS


MAST CELL


ADIPOSE CELLS
Nucleus
Nucleus
Fat or
"signet ring"
cell
Venule
Fat or
"signet ring"
cell

Thank you and Good Luck