



Medical Biology

Connective Tissue

It is the most numerous tissues in the body, which connects the structures with each other, it characterized by:

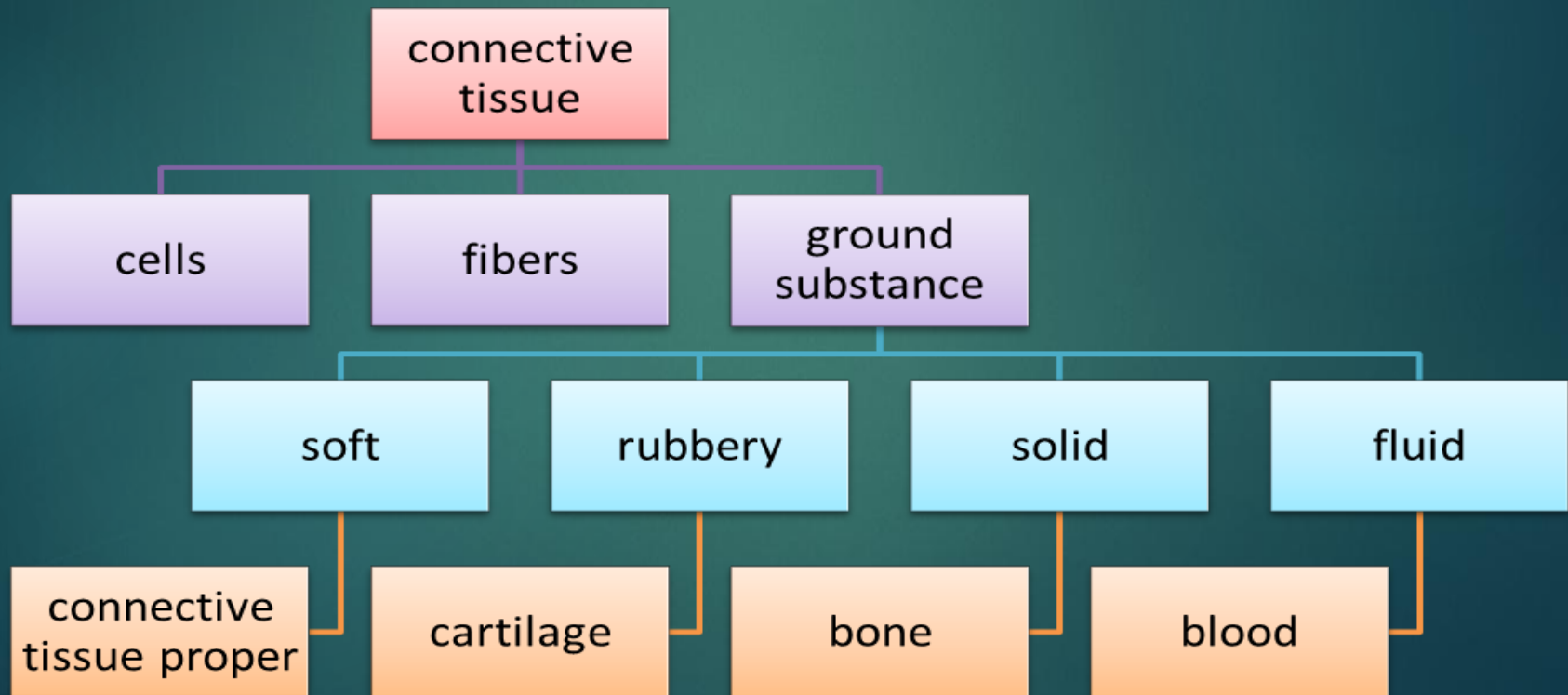
- ▶ binding and supporting the organs.
- ▶ it is vascular except the cartilage.
- ▶ it is derived from mesoderm layer.
- ▶ Cells are widely separated (large amount of matrix).

Connective tissue is composed of:

- ▶ Cells
- ▶ Extracellular matrix

The extracellular matrix is composed of:

- ▶ fibers (collagen fibers, reticular fibers, elastic fibers)
- ▶ ground substance is a highly hydrophilic viscous complex of anionic macromolecules.



Functions of connective tissue

- ❑ **1-Establishing a structural framework and Protecting delicate organs:**
- ❑ **2-Transporting fluids and dissolved materials:**
- ❑ **3-Storing energy reserves:**
- ❑ **4-Defending the body from microorganisms:**

Structure of Connective Tissue

3 classes of components

1- Cells

- 1-Fibroblast.
- 2-Macrophage.
- 3-Mast cell.
- 4-Plasma cell.
- 5-Lymphocytes.
- 6-Leukocytes.
- 7-Adipose cell.

2- Fibers

Reticular

Elastic

Collagen

Extracellular matrix

3- Ground substance

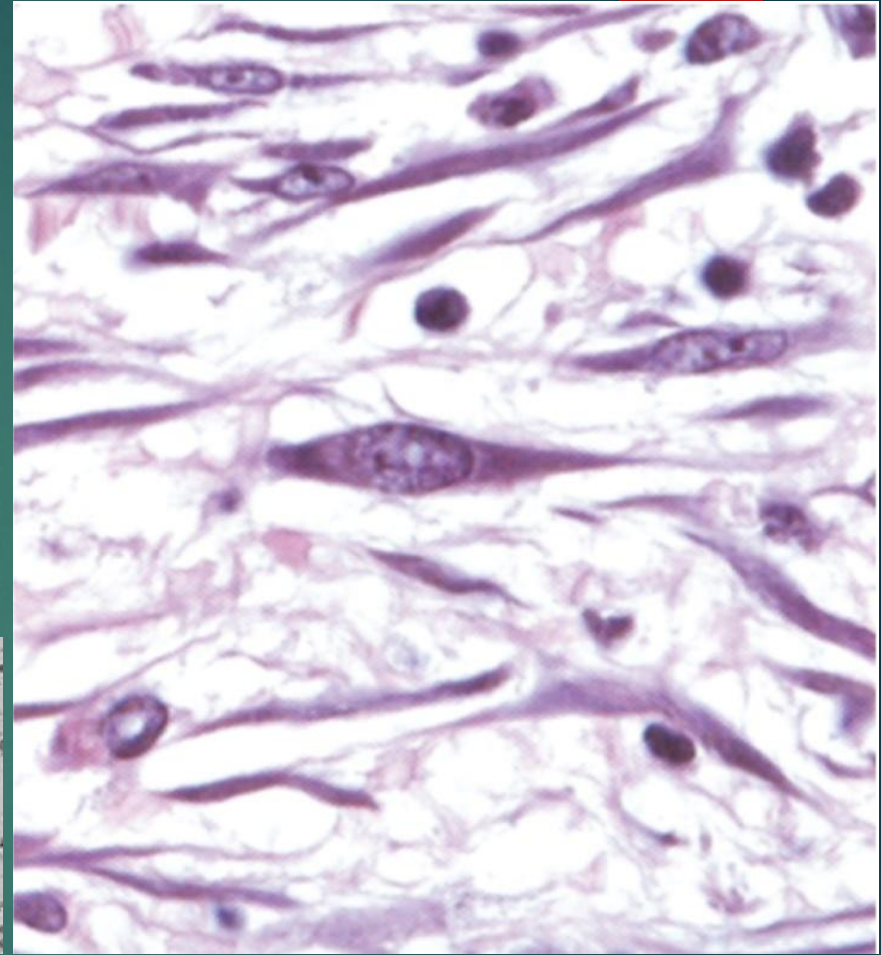
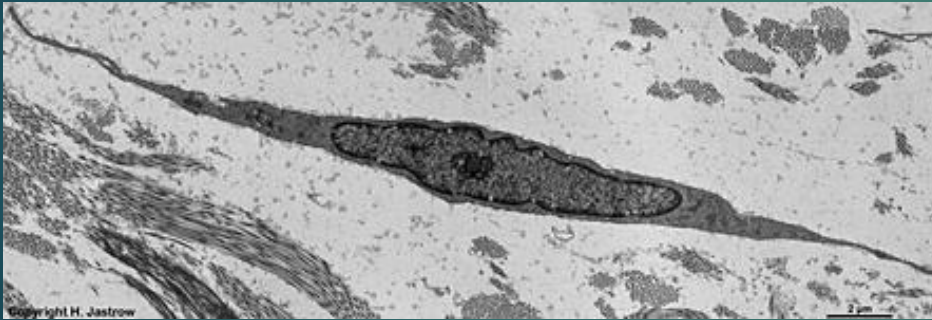
macromolecules

multiadhesive glycoproteins

Connective tissue component

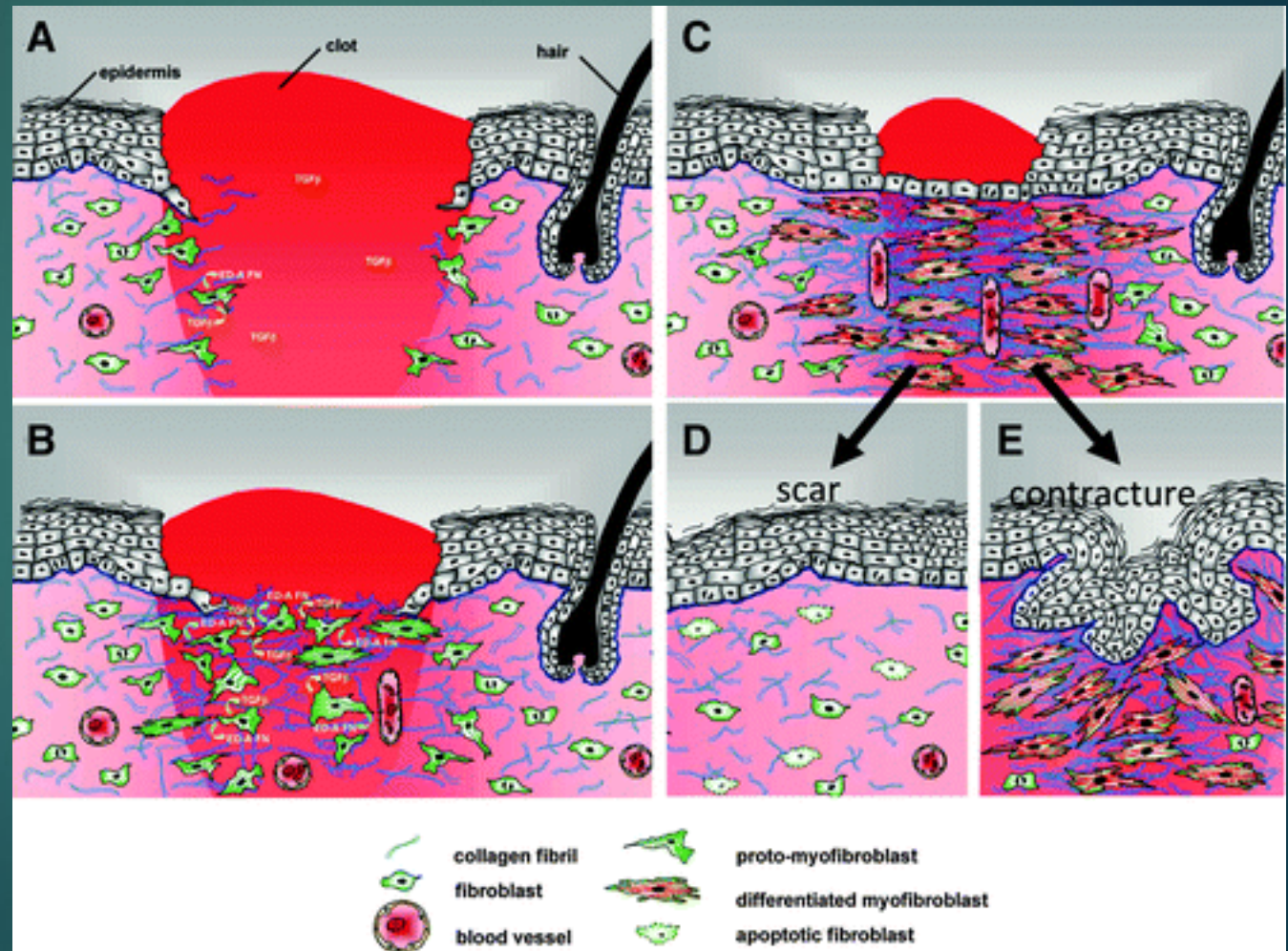
Cells:

Fibroblasts:

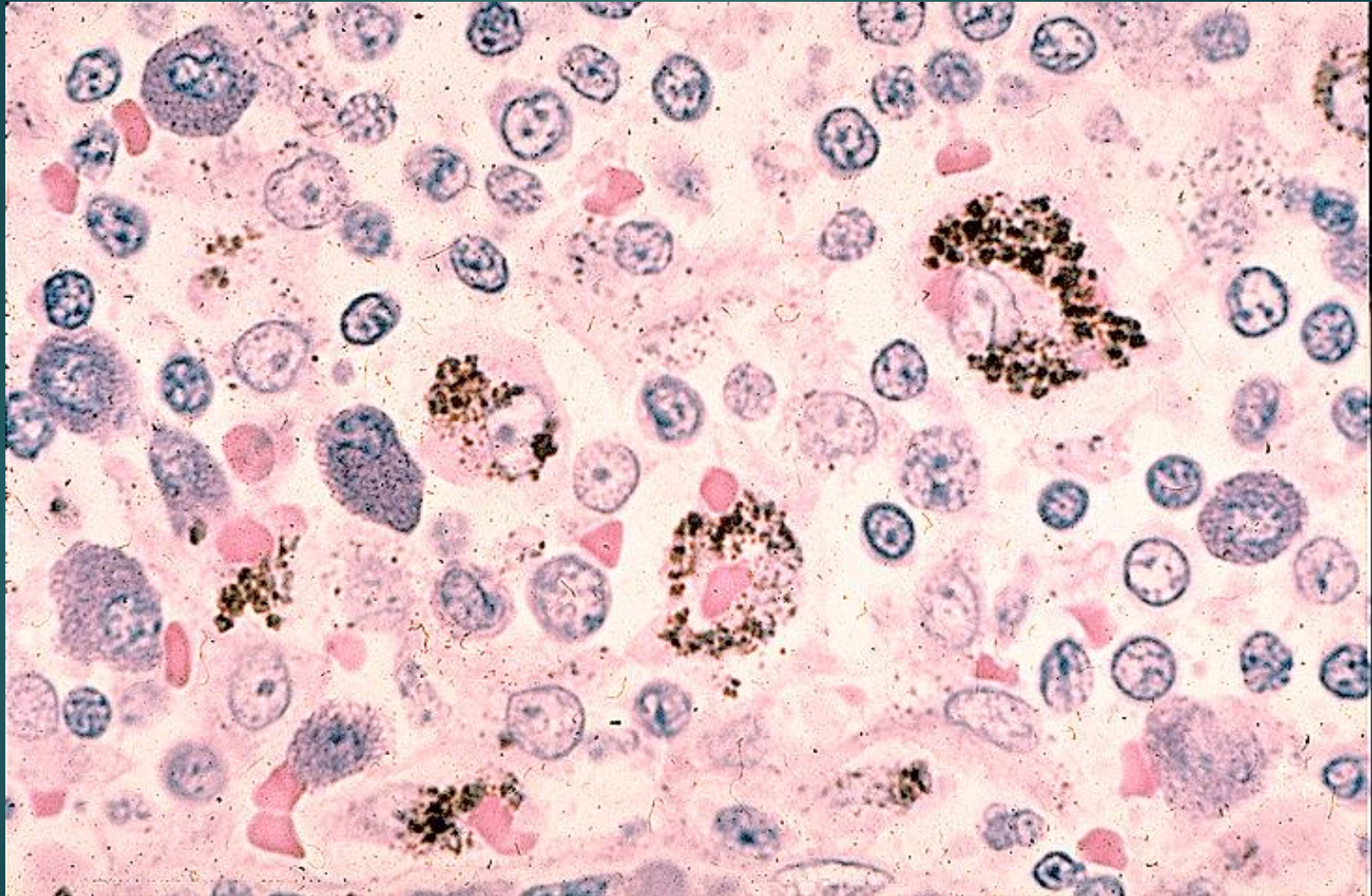


MEDICAL APPLICATION

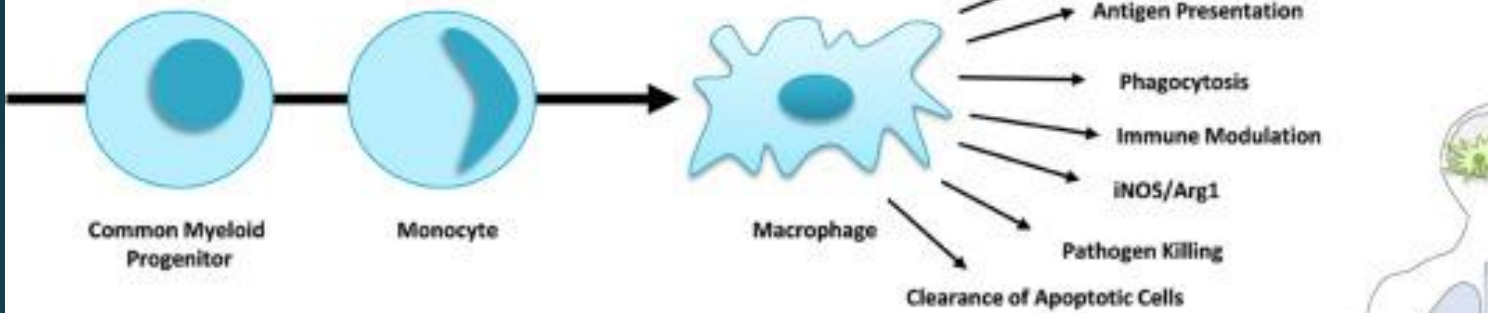
- ▶ Myofibroblast
- ▶ wound contraction.



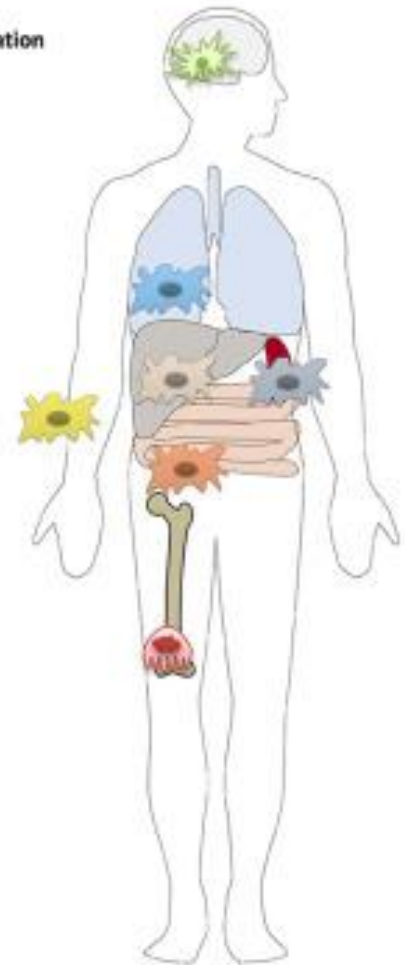
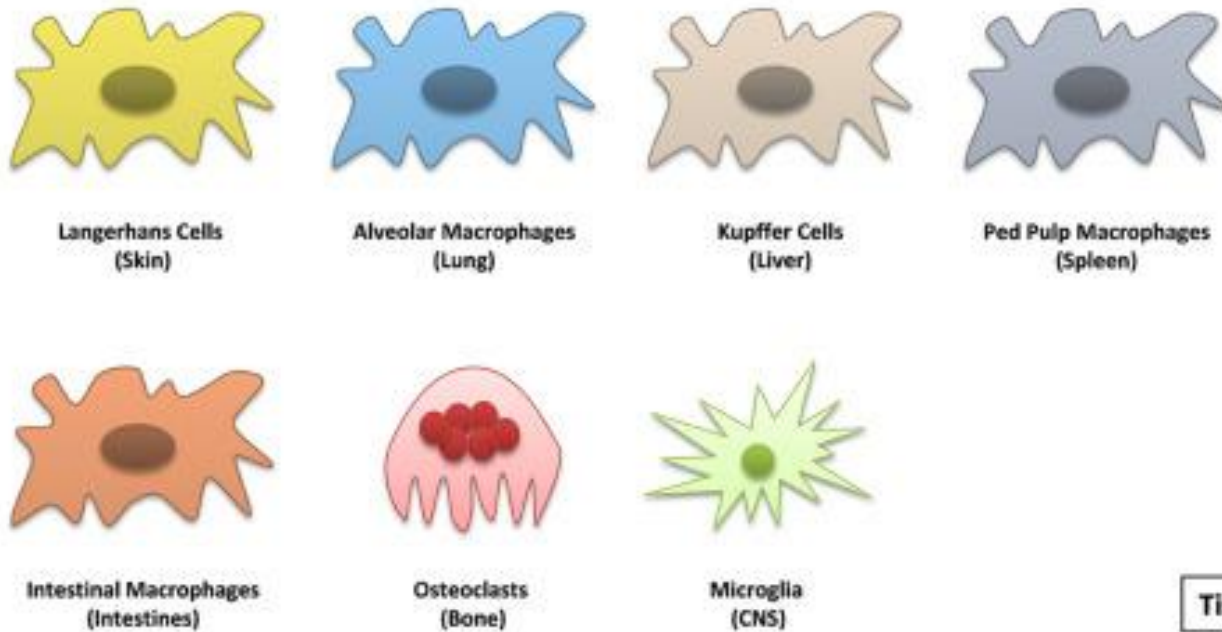
● Macrophages



Macrophage Origin and Functionality



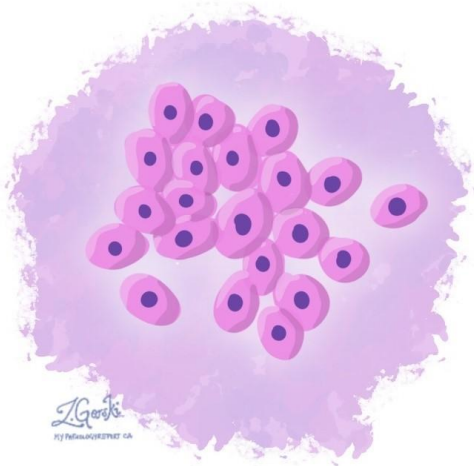
Common Tissue Resident Macrophages



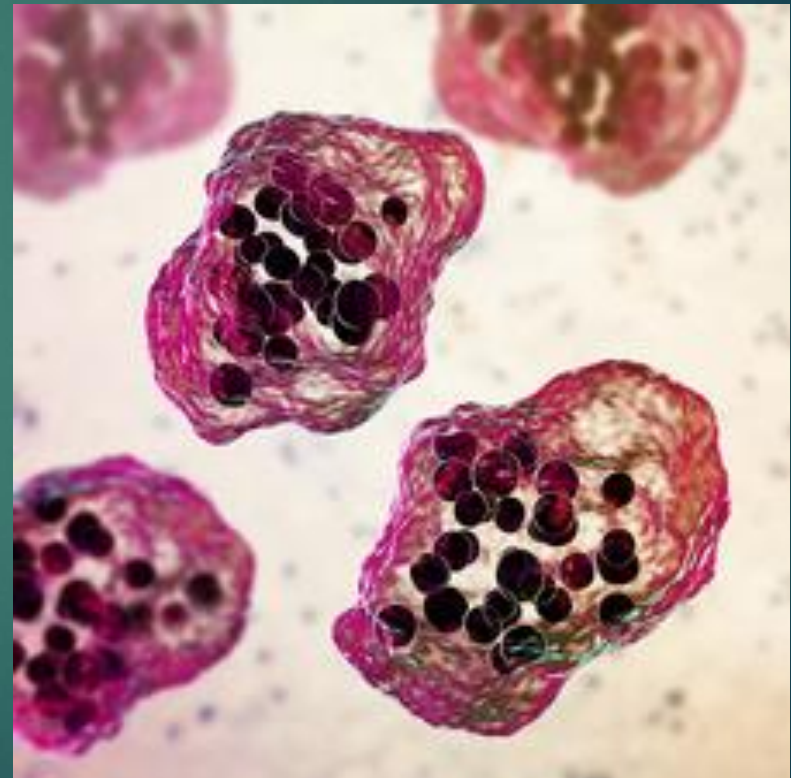
Tissue Departmentalization of Macrophages

MEDICAL APPLICATION

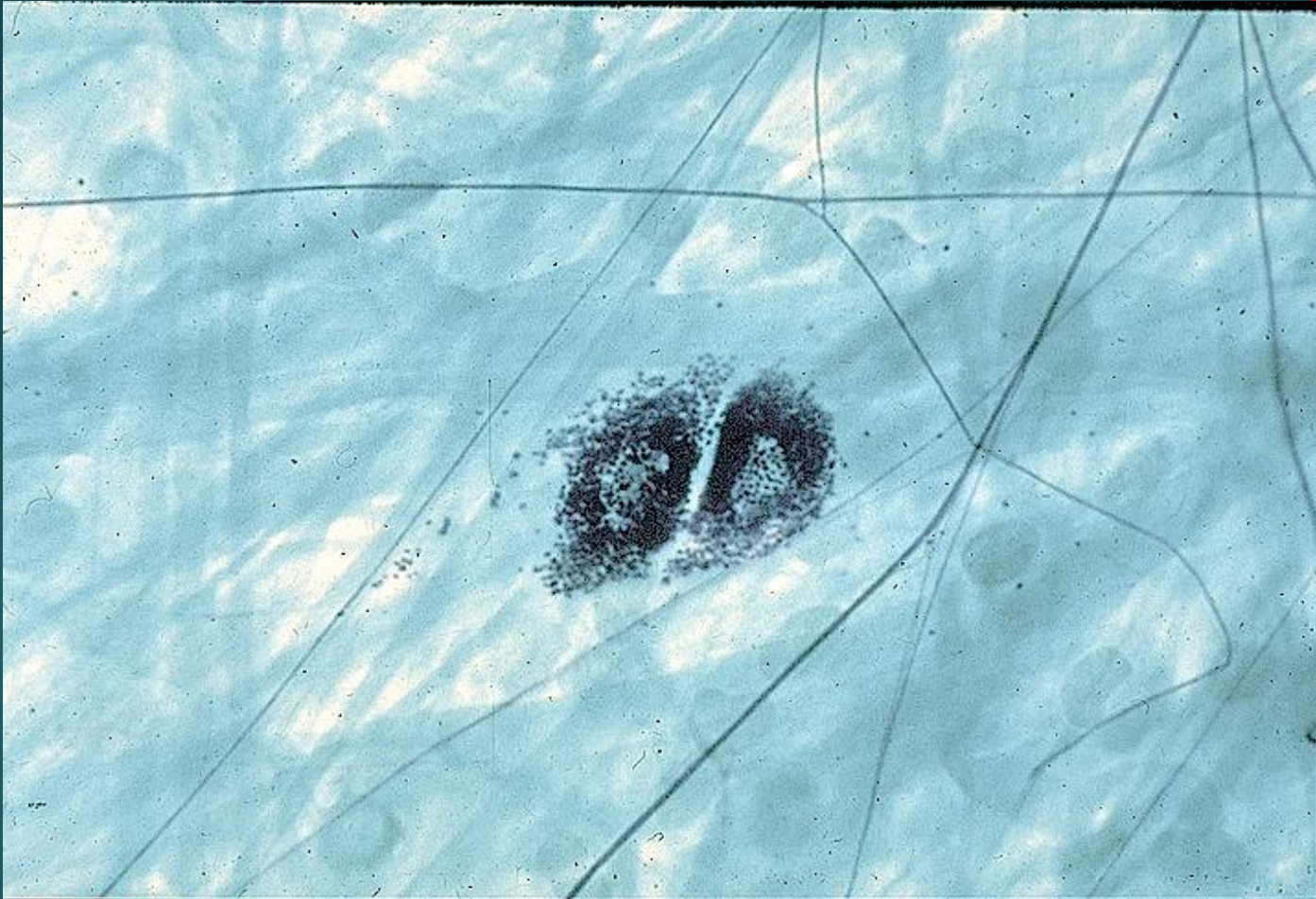
EPITHELIOD CELLS



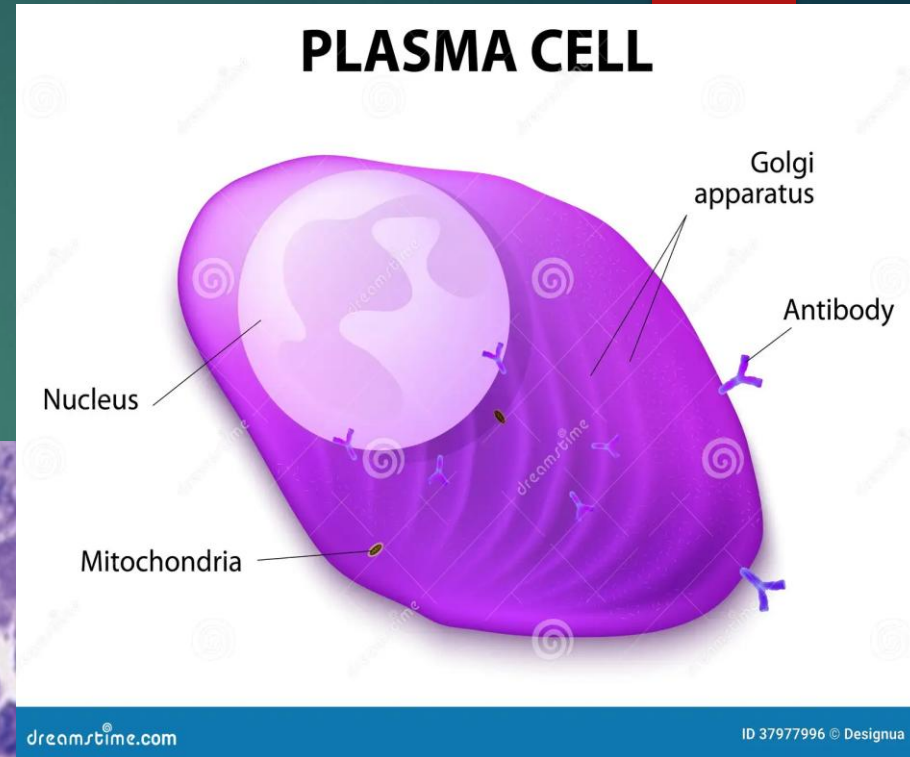
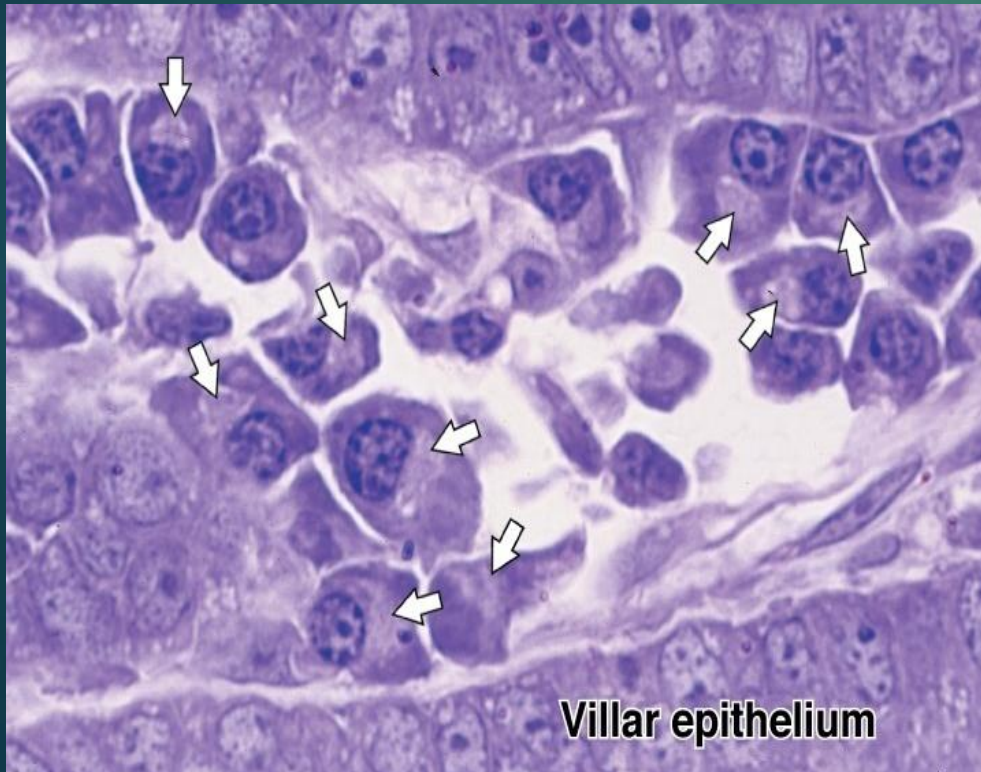
multinuclear
giant cells



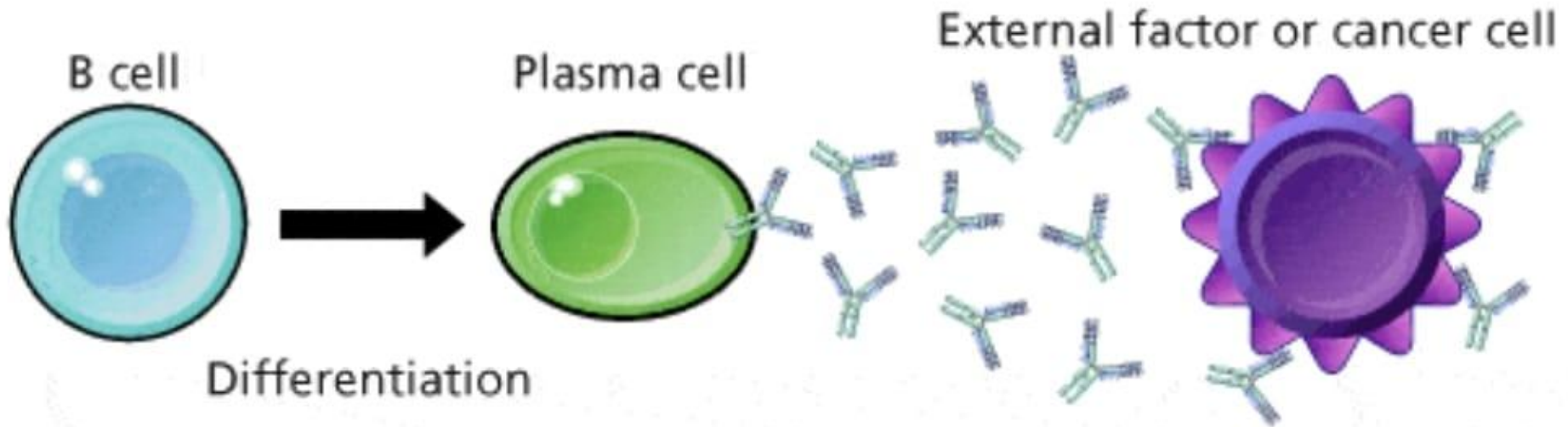
Mast cells



Plasma cells:



MEDICAL APPLICATION



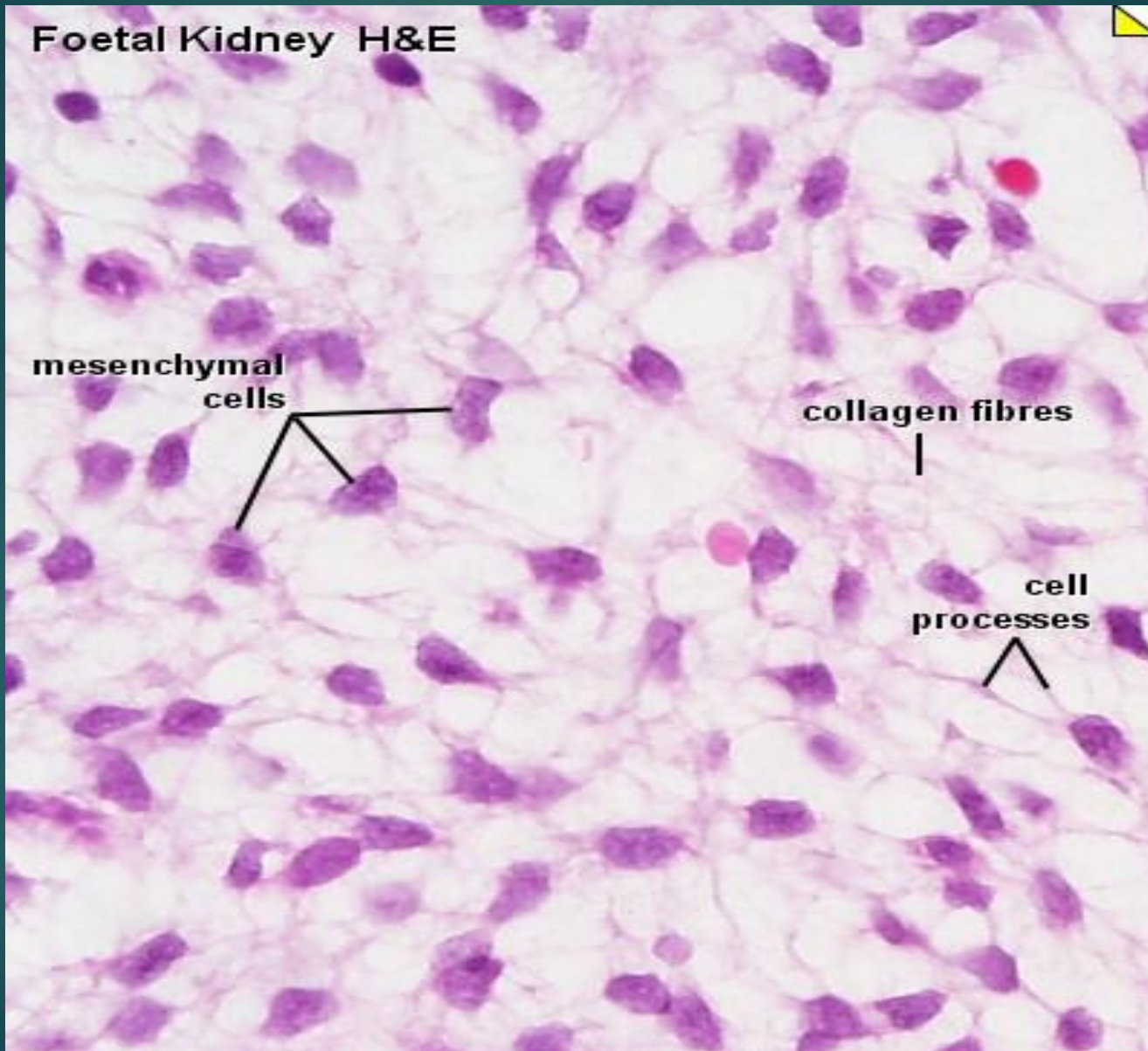
▶ **Leukocytes:**

- ▶ The white blood cells (lymphocytes, eosinophils, and basophils) are commonly found in connective tissue. They migrate from the blood vessels to the connective tissue, especially to sites of injury or inflammation.

▶ **Undifferentiated mesenchymal cells (cells of regeneration):**

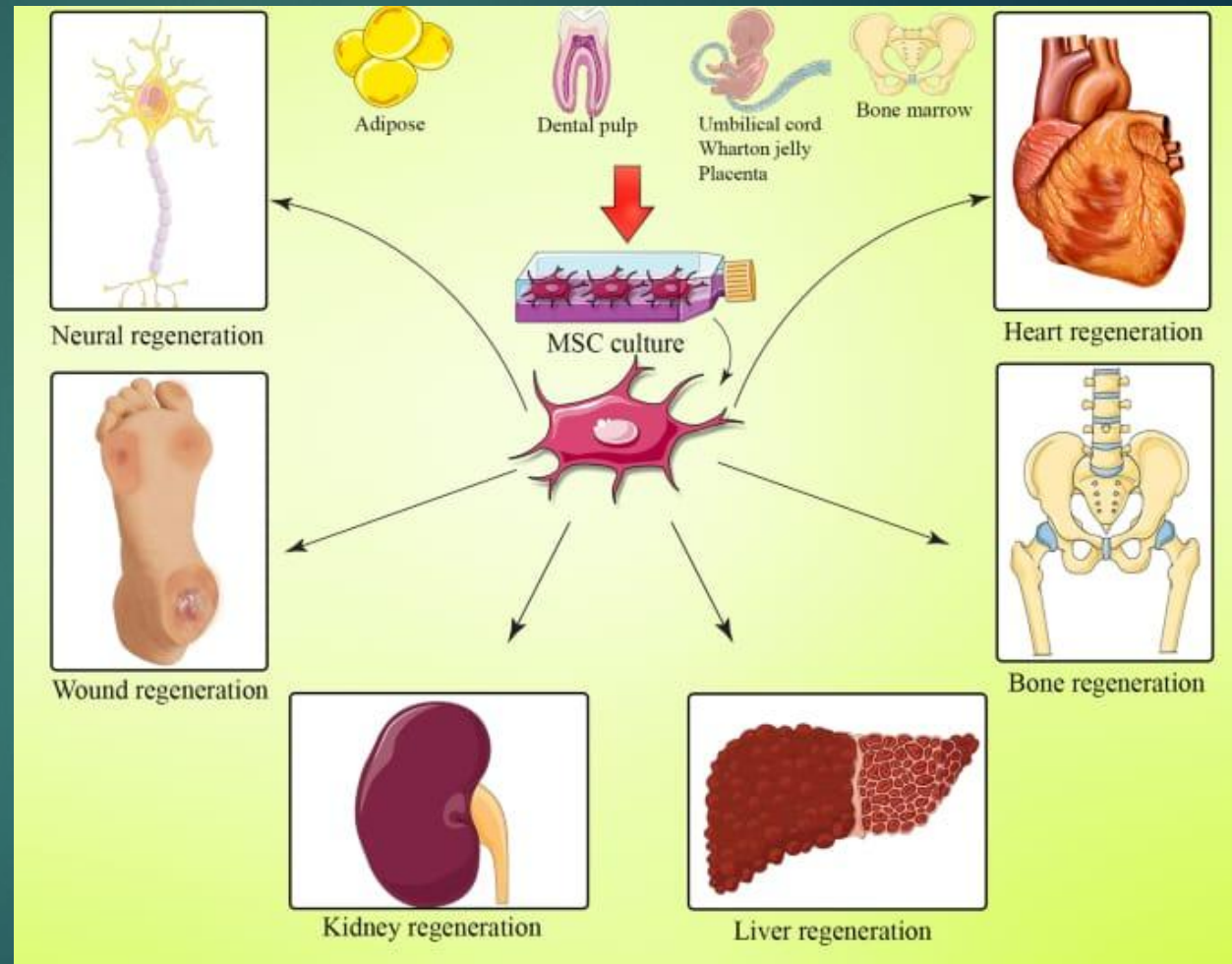
- ▶ These cells have ability to give rise any kind of cells, it form fibroblast, osteoblasts, chondrocytes and adipocytes, they are smaller than fibroblast but have the same appearance, so it characterized by small cell body, with few cytoplasmic processes, large round nucleus with a prominent nucleolus.

Foetal Kidney H&E



MEDICAL APPLICATION

- Some cells in mesenchyme are multipotent stem cells potentially useful in regenerative medicine after grafting to replace damaged tissue in certain patients. Mesenchyme-like cells remain present in some adult connective tissues, including that of tooth pulp and some adipose tissue, and are being investigated as possible sources of stem cells for therapeutic repair and organ regeneration.



Thank you

