

Plasma cells

These are few in numbers in most connective tissue generally, but are found in greatest numbers in serous membrane and lymphoid tissues. They are numerous in the sites subject to penetration by bacteria and foreign proteins such as gastrointestinal and respiratory tract. Plasma cells are derived from B lymphocytes. Plasma cells are large and ovoid with basophilic cytoplasm which is richness in rough endoplasmic reticulum. The nucleus is spherical and eccentric in position, containing compact, coarse heterochromatin radiating out from the center and alternating with lighter areas of euchromatin approximately equal size. This arrangement giving the nucleus a clock-face appearance (Figure 1).

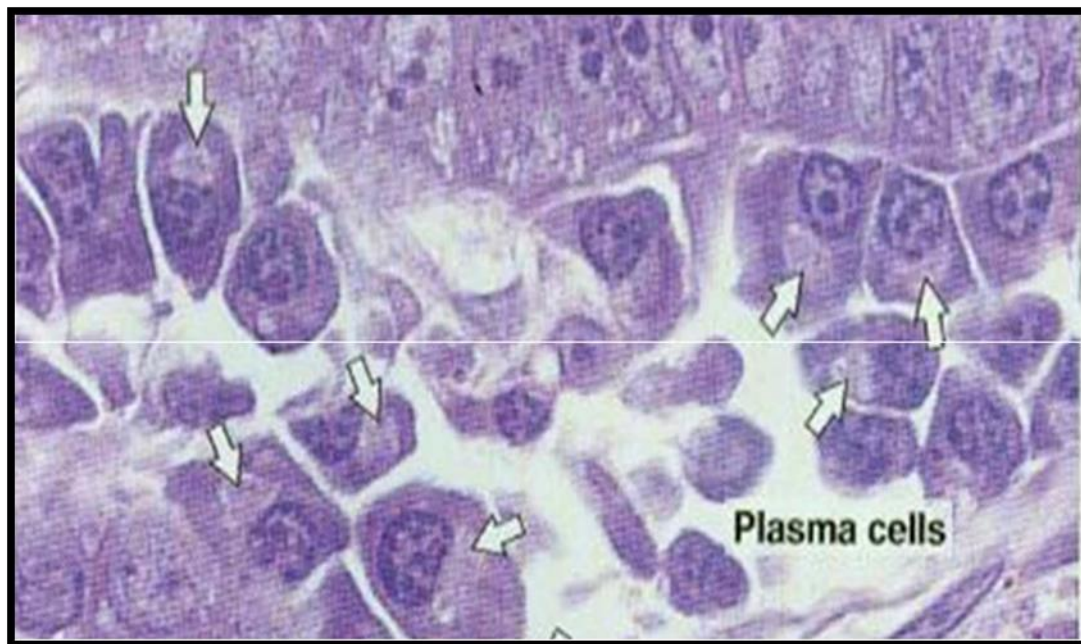


Figure (1): The characteristic features of plasma cells.

The function of these cells are responsible for the synthesis of the antibodies. Antibodies are immunoglobulins produced in response to penetration by antigens. Each antibody reacts with specific antigens to

neutralize harmful effects of that antigens and protect the body against the microorganism.

Adipose cells

Adipose cells also called fat cells are derived from undifferentiated mesenchymal cells also may arise from fibroblasts. These cells occur singly or in groups along the blood vessels. Adipocytes are large spherical cells, that become polyhedral in shape when crowded into adipose tissue. Each cell containing single large lipid droplet surrounded by thin rim of cytoplasm and eccentric flattened nucleus (Figure 2). These cells are specialized in synthesis, storage and release of fats for the production of heat.

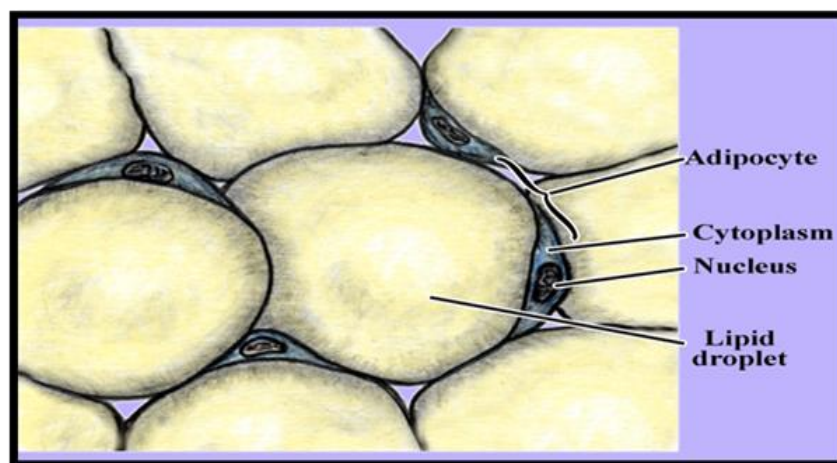


Figure (2): The characteristic features of adipose cells.

Undifferentiated mesenchymal cells

They consider embryonic cells that persist in adult. These are located along the wall of blood vessels particularly capillaries and venules where they are called perivascular cells (pericytes).

Mesenchymal cells resemble fibroblasts but in general are smaller. These cells are stellate in shape, have large oval nucleus and little cytoplasm which extends as thin small processes in several directions (Figure 3).

These cells are more primitive than fibroblasts and considered undifferentiated cells which under the influence of certain stimuli (as inflammation, in repair, and formation of new tissues as in wound healing) they can develop into other type of cells when the need arises for replacement or repair of connective tissue.

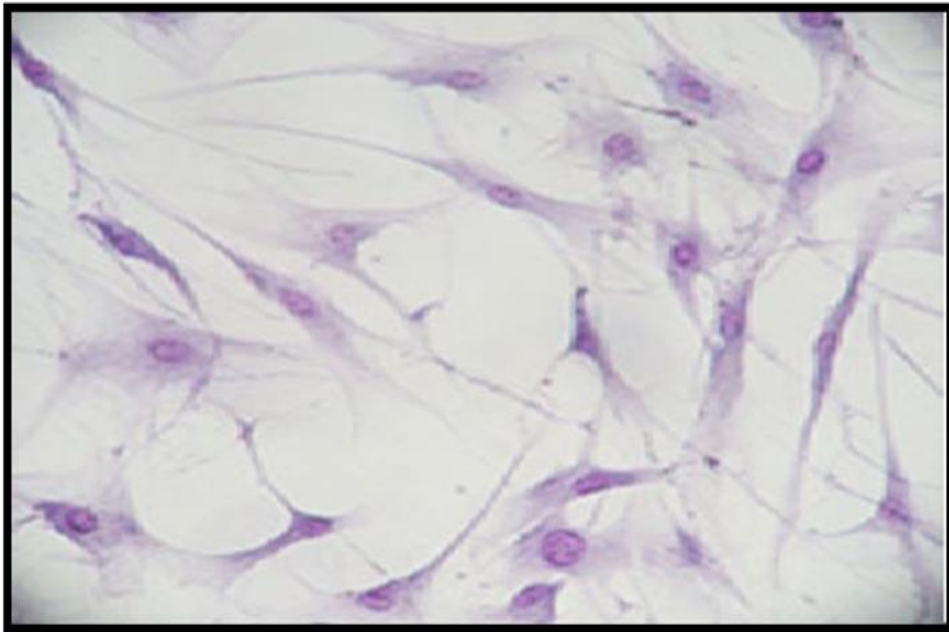


Figure (3): The characteristic features of Mesenchymal cells.

Reticular cells

These cells are stellate or elongated in shape have basophilic cytoplasm and oval pale nucleus (Figure 4). These cells indistinguishable from fibroblasts. Some of these cells resemble mesenchymal cells which can differentiate into diverse cell types so called primitive reticular cells and other

cells called phagocytic reticular cells which they are actively phagocytic where play role in defense mechanism.

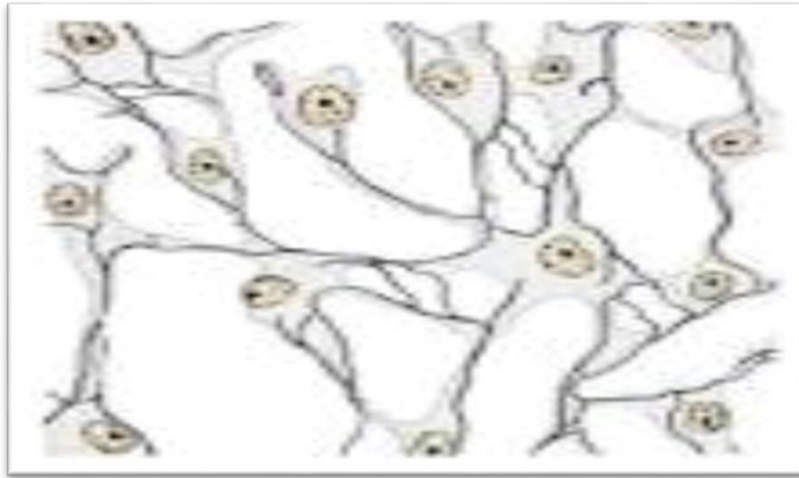


Figure (4): The characteristic features of reticular cells.

Leukocytes (White blood cells)

Although these cells are circulated in the blood stream they are encountered within connective tissue. Leukocytes are normally found in small numbers within connective tissue, but their number increase greatly in response to inflammation and other diseases, where the cells rapidly migrate from the blood stream to enter the connective tissue.

These cells include: Neutrophils, Eosinophils, Monocytes, Basophils, and Lymphocytes where play important role in defense mechanism during inflammation or infection by any microorganism.

The types of connective tissues

There are several types of connective tissue that consist of the basic components fibers, cells, and ground substance. The names given to the various types denote either the component that predominant in the tissue or a structural characteristic of the tissue.

1-Embryonic connective tissue

a-Mesenchymal connective tissue

b-Mucous connective tissue

2-Connective tissue proper

a-Loose (areolar) connective tissue

b-Dense connective tissue:

1-Dense irregular connective tissue

2- Dense regular connective tissue:

a-Collagenous connective tissue

b- Elastic connective tissue

3- Specialized connective tissue

a-Reticular connective tissue

b-Adipose connective tissue

c-Blood

4-Supportive Connective Tissue

a- Cartilage

b-Bone

1-Embryonic connective tissue

a- Mesenchymal connective tissue (Mesenchyme)

It presents only in the early weeks of embryo life, and subsequently is disappears when its cells undergo differentiation from which all types of connective tissue are derived.

This primitive tissue is composed of mesenchymal cells which are small spindle or fusiform in shape, with branching cytoplasmic processes contact with similar processes of neighboring cells forming network in this tissue.

It has gel-like ground substance containing few scattered collagen fibers and reticular fibers (Figure 5). The mesenchymal cells are specialized where able to differentiate into different types of cells in mature connective tissue. secretion of ground substance, fibers, proliferation and differentiation into different connective tissue cell types, smooth muscle cells, blood cells, et al.

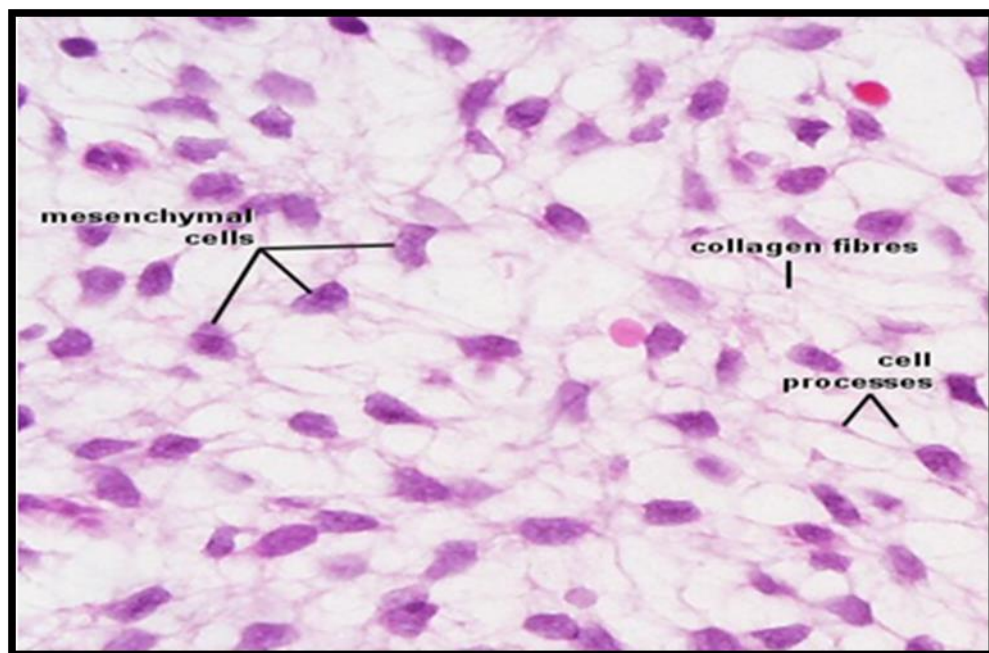


Figure (5): The mesenchymal connective tissue.

b- Mucous connective tissue

It is primitive (embryonic) tissue which appear only during development of embryo. It is present only in the umbilical cord.

The ground substance is abundance appear as jelly-like matrix (Wharton's jelly) containing delicate irregularly arranged of collagen fibers and reticular fibers. The cells in this tissue are mainly fibroblasts which are large spindle or stellate in shape with thin cytoplasmic processes that fuse with those of adjacent cells (Figure 6).

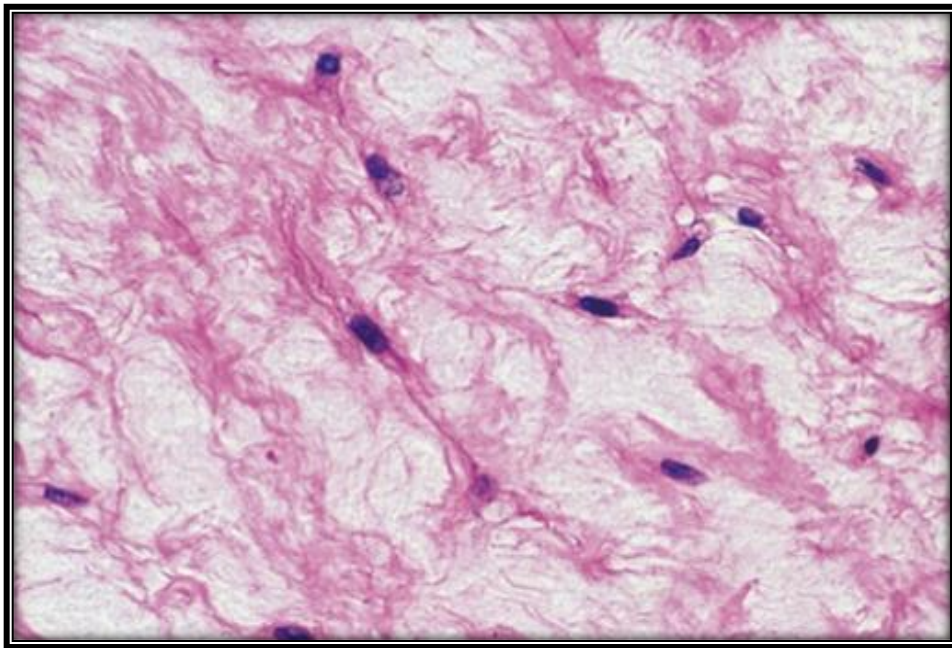


Figure (6): The mucous connective tissue.