Dep. Of Pathogenic Analysis

Histology lectures

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Connective Tissue

- The term connective tissue is applied to a tissue which fills the interstices between more specialized element and serve to hold them together and support them , for these reason connective tissue also called support tissue . it consist of three component that is cells, fibers and ground substance each of which are important in classification of connective tissue .

- *Connective tissue is composed of cells and extracellular matrix consisting of ground substance and fibers*

FUNCTIONS OF CONNECTIVE TISSUE

Although many functions are attributed to connective tissue, its primary functions include:

1-Providing structural support

2-Serving as a medium for exchange

3-Aiding in the defense and protection of the body

4-Forming a site for storage of fat

●CELLULAR COMPONENTS

The cells in connective tissues are grouped into two categories: fixed cells and transient cells

■Fixed cells are a resident population of cells that have developed and remain in place within the connective tissue, where they perform their functions. The fixed cells are a stable and long-lived population that includes:

- Fibroblasts
- Adipose cells
- Pericytes
- Mast cells
- Macrophages

Fibroblasts

Fibroblasts, the most abundant cell type in the connective tissue, are responsible for the synthesis of almost all of the extracellular matrix.

Pericytes

Pericytes surround endothelial cells of capillaries and small venules and technically reside outside the connective tissue compartment, because they possess their own basal lamina

Adipose Cells (Fat cells)

Adipose cells are fully differentiated cells that function in the synthesis, storage, and release of fat.

Mast Cells

Mast cells arise from bone marrow stem cells and function in mediating the inflammatory process and immediate hypersensitivity reactions.

Macrophages

Macrophages belong to the mononuclear phagocytic system and are subdivided into two groups of cells, phagocytes and antigen-presenting cells

Transient cells (free or wandering cells) originate mainly in the bone marrow and circulate in the bloodstream. these cells leave the bloodstream and migrate into the connective tissue to perform their specific functions. Transient cells include:

- Plasma cells
- Lymphocytes
- Neutrophils
- Eosinophils
- Basophils
- Monocytes
- Macrophages

Plasma Cells

Plasma cells are derived from B lymphocytes and manufacture antibodies

Leukocytes

Leukocytes exit the bloodstream during inflammation, invasion by foreign elements, and immune responses in order to perform various functions

Monocytes have been discussed under "Macrophages."

Neutrophils phagocytose and digest bacteria in areas of acute inflammation, resulting in formation of pus, an accumulation of dead neutrophils and debris.

Eosinophils, like neutrophils, are attracted to areas of inflammation by leukocyte chemotactic factors.

Eosinophils combat parasites by releasing cytotoxins. They also are attracted to sites of allergic inflammation, where they moderate the allergic reaction and phagocytose antibody-antigen complexes.

Basophils (similar to mast cells) release preformed and newly synthesized pharmacological agents that initiate, maintain, and control the inflammatory process.

Lymphocytes are present only in small numbers in most connective tissue, except at sites of chronic inflammation, where they are abundant.

Cell type	Main product or activity	Main function
Fibroblast	Production of fibers and ground substances	Structural
Plasma cell	Production of antibodies	Immunologic
Lymphocyte	Production of immune complement cells	Immunologic
Eosinophilic leucocyte	Phagocytosis of antigen-antibody complex	Immunologic
Macrophage	Phagocytosis of foreign substances , bacteria	Defense
Mast cell	Liberation of histamine	Defense
Adipose cell	Storage of neutral fats , heat production	Energy reservoir , heat production

Classification of Connective Tissues

A. Embryonic connective tissues

1. Mesenchymal connective tissue
2. Mucous connective tissue

B. Connective tissue proper

1. Loose (areolar) connective tissue
2. Dense connective tissue

a. Dense irregular connective tissue

b. Dense regular connective tissue

(1) Collagenous

(2) Elastic

3. Reticular tissue
4. Adipose tissue

C. Specialized connective tissue
1. Cartilage
2. Bone
3. Blood

Thank you

for

Listening