Cellular and Molecular Immunology 10th edition Abbas Test Bank

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Test Bank

Chapter 2: Cells and Tissues of the Immune System

Matching

Questions 1-5
Match each of the descriptions in questions 1-5 with the appropriate name (A-M) of an anatomic feature of lymphoid tissues.

A. Periarteriolar lymphoid sheath
B. Thymic medulla
C. Thymic cortex
D. Parafollicular cortex of lymph node
E. Hematopoietic bone marrow
F. Afferent lymphatic
G. Efferent lymphatic
H. Marginal zone
I. Red pulp of spleen
J. White pulp of spleen
K. Epidermis
L. Dermis
M. Peyer's patch

1. Location of most T lymphocytes in the spleen

ANS: A. The periarteriolar lymphoid sheath surrounds the central arteries in the spleen and is the T cell zone in this organ.

2. Vessels that drain lymph away from a lymph node

ANS: G. Efferent lymphatic vessels drain lymph away from lymph nodes; afferent vessels drain lymph into lymph nodes.

3. Site of least mature T cell precursors in the thymus

ANS: C. Bone marrow–derived T cell precursors first enter the thymic cortex and migrate into the medulla as they become more mature.

4. Location of Langerhans cells

ANS: K. Langerhans cells are dendritic cells in the epidermis of the skin that develop from fetal macrophages.

5. Lymphoid aggregate of the mucosal immune system

ANS: M. Peyer's patches are B cell–rich lymphoid aggregates located in the submucosa of the small intestine.

Multiple Choice

6. Which of the following is the generative (primary) lymphoid organ for T lymphocytes?
A. Bone marrow
B. Spleen
C. Lymph node
D. Thymus
E. Tonsil

ANS: D. Generative (primary) lymphoid organs are the organs where lymphocytes first express antigen receptors and attain functional maturity. Although T cell precursors arise in the bone marrow, these precursors migrate to the thymus, where maturation takes place. In contrast, B cells mature in the bone marrow. Spleen, lymph node, and tonsil are secondary lymphoid organs populated by mature B and T cells.

7. Which of the following statements about tissue-resident macrophages is correct?
A. They are all derived from blood monocytes that enter tissues during infections
B. Many of these cells first populate tissues during fetal development
C. They differentiate from different kinds of epithelial cells in each tissue
D. They constantly recirculate between different tissues
E. They are professional antigen-presenting cells that activate naive T cells that migrate into tissues

ANS: B. Many tissue-resident macrophages are derived from fetal yolk sac and fetal liver precursors and establish residence in the different tissues during fetal development. Other tissue-resident macrophages are derived from bone marrow–derived blood monocytes that enter tissues under normal conditions or during infections. Epithelial cells do not differentiate into macrophages. Once in the tissue, tissue-resident macrophages cells do not leave to recirculate. Naive T cells do not usually enter non-lymphoid tissues, and tissue-resident macrophages have no role in presenting antigen to naive T cells.

8. Which type of leukocyte is the most abundant in the blood of a healthy adult?
A. Monocytes
B. B lymphocytes
C. T lymphocytes
D. Polymorphonuclear leukocytes
E. Basophils

ANS: D. Polymorphonuclear leukocytes (or neutrophils) are the most abundant blood leukocyte (~ 4,000/mm^3), about twice the number of B and T lymphocytes combined.

9. Which of the following is a feature of fibroblastic reticular cells (FRCs)?
A. They line the lumens of lymphatics entering lymph nodes
B. They are derived from hematopoietic precursors
C. They play a critical role in establishing where lymphocytes are located in lymph nodes
D. They secrete cytokines that stimulate T cell proliferation
E. They are phagocytic cells of innate immunity that kill microbes

ANS: C. FRCs are mesenchymal-derived (not haematopoietically-derived) cells with properties of muscle and fibroblast (myofibroblasts) that drive formation of secondary lymphoid organs during embryonic development and contribute to the anatomic segregation and movement of lymphocytes and dendritic cells in secondary lymphoid organs. They are not phagocytic, have no direct antimicrobial effector functions, do not secrete IL-2 or other T cell growth factors, and do not line lumens of lymphatics.

10. Which type of cell is most important in capturing protein antigens of microbes that enter through epithelial barriers and presenting them to naive T cells in secondary lymphoid organs?
A. Classical dendritic cells
B. Plasmacytoid dendritic cells
C. Plasma cells
D. Macrophages
E. Follicular dendritic cells

ANS: A. Classical (or conventional) dendritic cells (DCs) are the main cell type that brings microbial antigens from infected tissues into draining lymph nodes and presents peptides derived from these antigens to naive T cells that circulate though the lymph nodes. Plasmacytoid DCs secrete type 1 interferons in response to viral infection. Plasma cells are antibody-secreting cells derived from B cells and do not present antigen to T cells. Macrophages can present antigen to effector T cells, but they are not efficient activators of naive T cells. Follicular dendritic cells display antigens to B cells on lymphoid follicles.