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Immunology & Serology in Laboratory Medicine

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PART I

Basic Immunologic Mechanisms

TABLE 1.8 Distribution of Lymphocytes in Lymphoid Organs and Other Tissues[a]

Site	CD4+ T Lymphocytes (%)	CD8+ T Lymphocytes (%)	T (T_{reg}) Lymphocytes (%)	B Lymphocytes (%)
Blood	35–60	15–40	0.5–2	5–20
Lymph nodes	50–60	15–20	5–10	20–25
Spleen	50–60	10–15	5–10	40–45

[a]Approximate numbers of lymphocytes in different organs of healthy adults.
Adapted from Abbas AK, Lichtman AH, Pillai S: *Basic immunology: functions and disorders of the immune system,* ed 6, 2020, Elsevier; Figs. 1.9 and 1.13 Valiathan R, Deeb K, Diamante M, et al: Reference ranges of lymphocyte subsets in healthy adults and adolescents with special mention of T cell maturation subsets in adults of South Florida, *Immunobiology* 219(7):487–496, 2014.

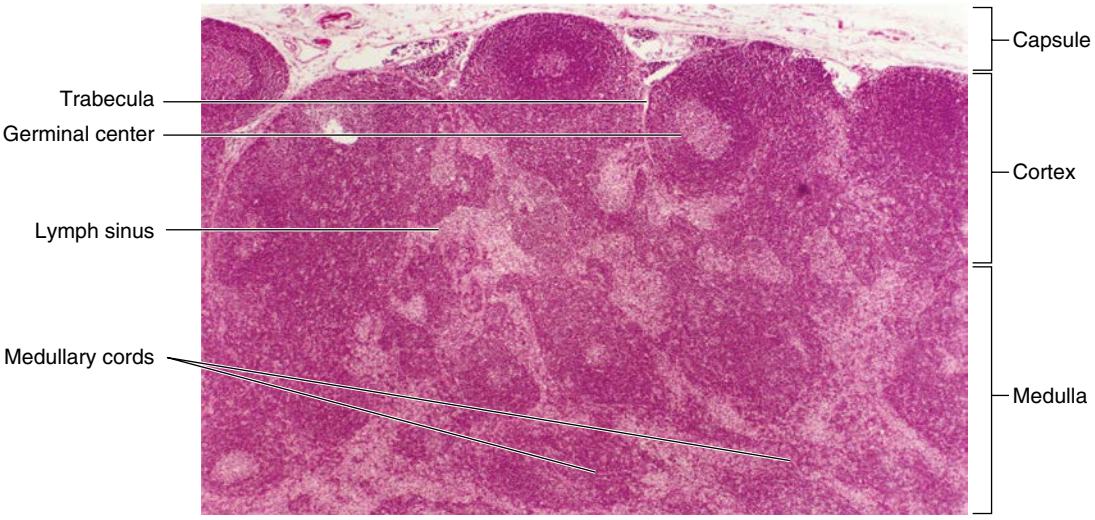

Fig. 1.15 Internal Structure of a Lymph Node. Photomicrography shows a portion of the cortex and medulla. (From Patton KT, Thibodeau GA: *Anthony's textbook of anatomy and physiology,* ed 20, St. Louis, 2013, Elsevier.)

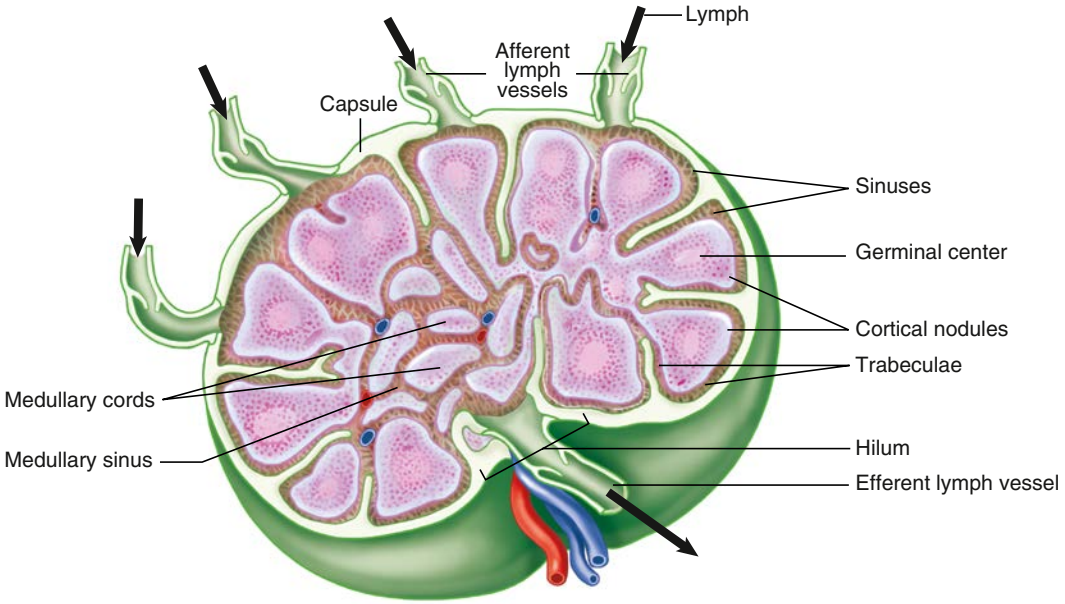

Fig. 1.16 Structure of a Lymph Node. Several afferent valved lymphatics bring lymph to the node. In this example, a single efferent lymphatic leaves the node at a concave area called the *hilum*. Note that the artery and vein enter and leave at the hilum. (From Patton KT, Thibodeau GA: *Anthony's textbook of anatomy and physiology,* ed 20, St. Louis, 2013, Elsevier.)

L

lag period The period between a stimulus (e.g., antigenic stimulation) and a reaction (e.g., immunoglobulin response).
lambda (λ) light chain One of two types of immunoglobulin light chains that are present in about one-third of all immunoglobulin molecules.
Langerhans cell A macrophage found in the skin.
large granular lymphocyte (LGL) Synonym for natural killer (NK) cell. About 75% of LGLs function as NK cells and appear to account fully for the NK activity in mixed cell populations.
laser Acronym for *l*ight *a*mplification by *s*timulated *e*mission of *r*adiation; used in flow cell cytometry to identify cells.
latent Hidden or inactive.
latent infection Persistent infection characterized by periods of reactivation of the signs and symptoms of the disease.
latex agglutination A technique similar to hemagglutination except that smaller, antigen-coated latex particles are substituted for erythrocytes for the detection of antibodies. Antibodies can be absorbed into the latex particles by binding to the Fc region of antibodies, leaving the Fab region free to interact with antigens present in the patient specimen.
lattice formation The establishment of crosslinks between sensitized particles such as erythrocytes.
lattice hypothesis A theoretical step in the production of agglutination.
lecithin A waxy phospholipid.
lecithin pathway A pathway for activation of complement based on the attachment of mannose-binding protein to components of bacterial cell walls.
lesion A localized pathologic change in a bodily organ or tissue, such as a cut, abrasion, or sore.
leukocyte A white blood cell (WBC) that functions in antigen recognition and antibody formation.
leukocyte integrin A glycoprotein on the cell surface of white blood cells.
leukocytosis A marked increase in the total circulating white blood cell concentration.
leukopenia A marked decrease in the total circulating white blood cell concentration.
leukotriene Class of compounds that mediate the inflammatory functions of leukocytes. These substances are a collection of metabolites of arachidonic acid, with powerful pharmacologic effects.
ligand A linking or binding molecule.
ligase chain reaction (LCR) A means of increasing signal probes through the use of an enzyme called ligase, which joins two pairs of probes only after they have bound to a complementary target sequence.
light (L) chain A small chain in an immunoglobulin molecule that is bound to the larger chain by disulfide bonds. There are two types of light chains, kappa and lambda.
light-chain disease (LCD) A dysproteinemia of the monoclonal gammopathy type. In LCD, only kappa or lambda monoclonal light chains, or Bence Jones proteins, are produced.
linear epitope Amino acids that follow one another on a single chain that act as a key antigenic site; linear antigenic determinant.
lipemia Visibly cloudy blood serum.
lipemic Pertaining to lipemia.
lipopolysaccharide (LPS) The major component of some Gram-negative bacterial cell walls that protects them from phagocytosis but activates C3 directly. LPS can also act as a B-cell mitogen.
liposome A particle of fatlike substance held in suspension in tissues.
liposome-enhanced (liposome-enhanced testing) A variation of latex testing.
live, attenuated vaccine A vaccine whose biological activity has not been inactivated, but whose ability to cause disease has been weakened.
localized Confined to a specific area.
localized inflammatory response A tissue reaction confined to a specific area. This response is caused by physical or chemical agents, including microorganisms. The manifestations of the response include redness, tenderness, pain, and swelling.
long terminal redundancy (LTR) A structure that exists at each end of the proviral genome and plays an important role in the control of viral gene expression and the integration of the provirus into the DNA of the host.
lupus anticoagulants Antibodies against substances in the lining of cells. These substances prevent blood clotting in a test tube. They are called phospholipids. People with antibodies to phospholipids (PLs) may have an overly high risk of forming blood clots. Circulating anticoagulants are believed to be associated with the presence of false-positive serologic test results for syphilis.
lupus erythematosus An autoimmune disorder.
luteal phase A period of the menstrual cycle.
luteinizing hormone A hormone associated with ovulation.
Lyme borreliosis A multisystem illness that primarily involves the skin, nervous system, heart, and joints.
Lyme disease A mosquito-borne infectious disease.
lymphadenopathy Disease of the lymph nodes.
lymphoblast The most immature stage of the lymphocyte type of leukocyte.
lymphocyte A small white blood cell found in lymph nodes and circulating blood. Two major populations of lymphocytes are recognized, T and B cells.
lymphocyte recirculation Process that enables lymphocytes to come into contact with processed foreign antigens and disseminate antigen-sensitized memory cells throughout the lymphoid system.
lymphocyte-activating factor See interleukin-1.
lymphocytopenia A severe decrease in the total number of lymphocytes in the peripheral blood.
lymphocytosis A significant increase in the total number of lymphocytes in the peripheral blood.
lymphokine A soluble protein mediator released by sensitized lymphocytes on contact with an antigen. See soluble mediator.
lymphokine-activated killer (LAK) cells A population of natural killer (NK) cells with enhanced cytolytic activity resulting from the addition of IL-2.
lymphoma Solid malignant tumor of the lymph nodes and associated tissues or bone marrow.
lymphopoietin-1 See interleukin-7.
lymphoproliferative disorder A group of diseases characterized by the proliferation of lymphoid tissues and/or lymphocytes.
lymphosarcoma Malignant neoplastic disorders of the lymphoid tissues, excluding Hodgkin disease.
lyse (lysing) To break apart or dissolve.
lysis Irreversible leakage of cell contents that occurs after membrane damage.
lysozyme (muramidase) An enzyme secreted by macrophages that attacks the cell walls of some bacteria.
lytic Refers to lysis.

M

M protein See monoclonal protein.
macroglobulin A high-molecular-weight protein of the globulin type.
macroglobulinemia See Waldenström primary macroglobulinemia.
macromolecular complex The reaction between the protein being assayed and a specific antiserum.
macrophage A large mononuclear phagocytic cell of the tissues that exists as a wandering or fixed type; lines the capillaries and sinuses of organs such as the bone marrow, spleen, and lymph nodes. This cell phagocytizes, processes, and presents antigens to T cells and is also responsible for removing damaged tissue, cells, bacteria, and other substances from the host.
macrophage migration inhibitory factor (MIF) A lymphocyte product that is chemotactic for monocytes. Other similar factors stimulate monocyte and macrophage functions.
macular lesion A discolored unraised (flat) spot on the skin.
maculopapular A lesion with macular and papular characteristics.
maintenance of self-tolerance The continuing ability to recognize self-antigens.
major histocompatibility complex (MHC) A genetic region in human beings and other mammals responsible for signaling between lymphocytes and antigen-bearing cells. It is also the major determinant of transplant compatibility (or rejection).
malaise A general feeling of tiredness or discomfort.
malignant (malignancy) Cancerous.
malignant neoplasia (malignant neoplasm) A cancerous new growth.
manifestation The development of the signs and symptoms of a disease or disorder.
mannose-binding lectin A pattern recognition molecule of the innate immune system.
mannose-binding lectin pathway A complement activation pathway.
margination The process of white blood cells clinging to the lining of blood vessels.
mass spectrometry An analytic technique that identifies the chemical composition of a

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