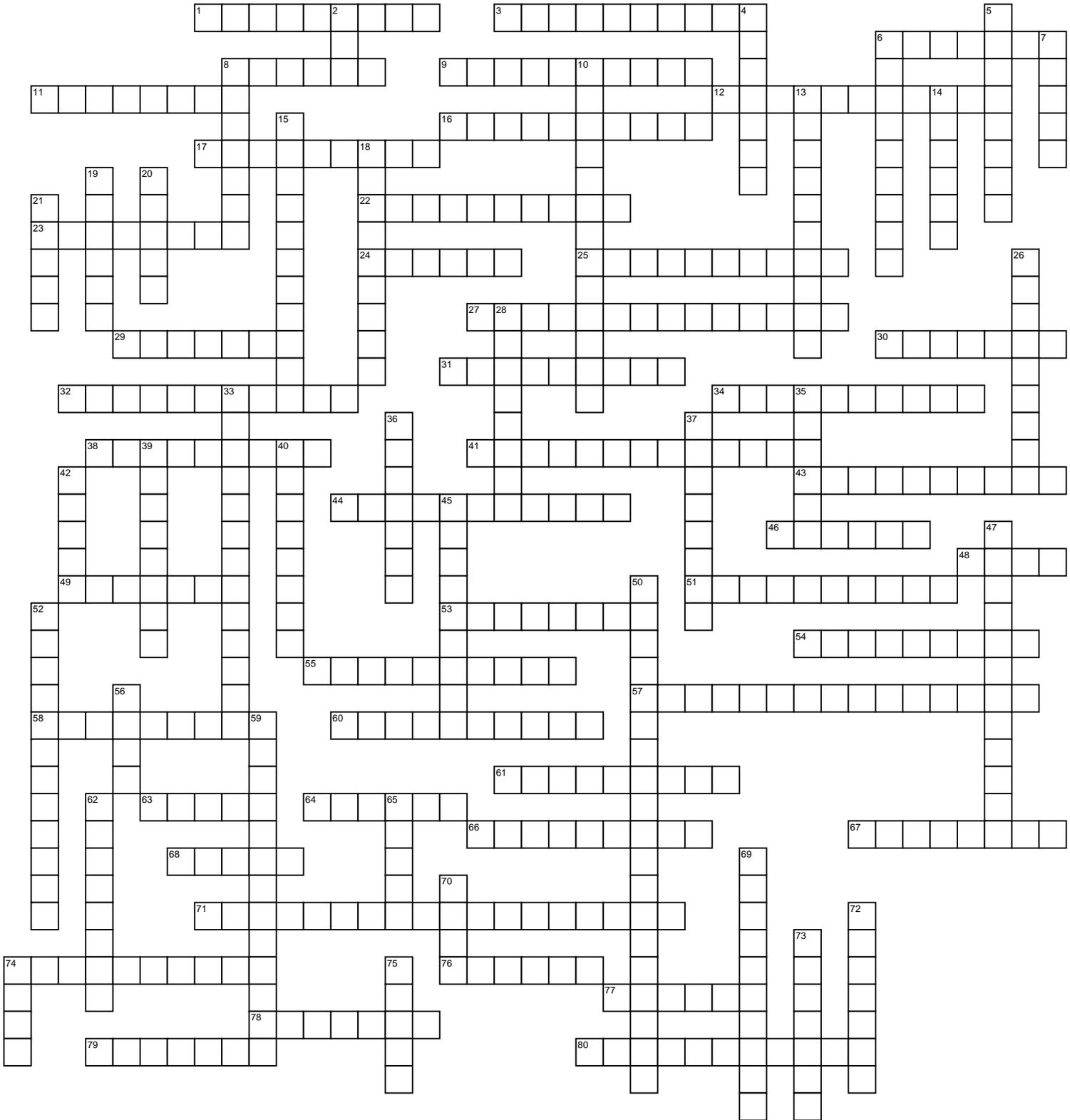


Immune System



ACROSS

- 1 _____ is a biogenic amine involved in local immune responses as well as regulating physiological function in the gut and acting as a neurotransmitter.
- 3 Antigen _____ is a biological process that prepares antigens for presentation to special cells of the immune system called T lymphocytes.
- 6 _____ tolerance is the mechanism by which newly developing T cells and B cells are rendered non-reactive to self.
- 8 The membrane _____ complex is typically formed on the surface of intruding pathogenic bacterial cells as a result of the activation of the complement system.
- 9 Monocytes and _____s are phagocytes, acting in both innate immunity as well as cell-mediated

immunity of vertebrate animals.

- 11 _____ is a cytolytic protein found in the granules of CD8 T-cells and NK cells. Upon degranulation, _____ inserts itself into the target cell's plasma membrane, forming a pore.
- 12 _____s are a group of cytokines that were first seen to be expressed by leukocytes as a means of communication.
- 16 A _____ is a monocyte derived tissue macrophage cell.
- 17 _____ are a type of glial cell that act as the immune cells of the central nervous system, acting as phagocytes, cleaning up CNS debris.
- 22 _____ antibodies are antibodies that are identical because they are produced by one type of immune cell that are all clones of a single parent cell.

- 23 An _____ is a nonparasitic antigen capable of stimulating a type I hypersensitivity reaction in atopic individuals.
- 24 With no cytotoxic or phagocytic activity, T _____ cells are a sub-group of lymphocytes playing an important role in establishing and maximizing the capabilities of the immune system.
- 25 _____s are a subset of cytokines that are produced by a type of immune cell known as a lymphocyte.
- 27 The _____ superfamily is a large group of cell surface and soluble proteins that are involved in the recognition, binding, or adhesion processes of cells.
- 29 _____ is an abnormal reaction to a substance foreign to the body that is acquired, predictable and rapid.

- 30 The _____ immune response is the aspect of immunity that is mediated by antibodies, produced by the cells of the B lymphocyte lineage.
- 31 _____ cells are immune cells with branched projections whose main function is to process antigen material and present it on the surface to other cells of the immune system.
- 32 _____s are naturally produced eicosanoid lipid mediators, which may be responsible for a number of the effects of asthma and allergies.
- 34 _____ granulocytes are white blood cells of the immune system that are responsible for combating infection by parasites in vertebrates
- 38 A _____ is a cell that ingests and destroys foreign matter such as microorganisms or debris.
- 41 Somatic _____ is a mechanism inside cells that diversifies the receptors that the immune system uses to recognize antigens.
- 43 _____ or immunoglobulins are proteins used by the immune system to identify and neutralize foreign objects, such as bacteria and viruses.
- 44 _____-1 is one of the first cytokines ever described, discovered as a factor that could induce fever, control lymphocytes, increase the number of bone marrow cells and cause degeneration of bone joints.
- 46 _____ B cells are a B cell sub-type that are formed following primary infection. They remember the same pathogen for faster antibody production in future infections
- 48 A _____ cell, or alveolar macrophage, is a type of macrophage found in the pulmonary alveolus which reside on respiratory surfaces and clean off particles such as _____ or microorganisms.
- 49 An _____-presenting cell is a cell that displays foreign immunogen material complexed with MHC on its surface. T-cells may recognize this complex using their T-cell receptor.
- 51 _____s (IFNs) are natural proteins produced by the cells of the immune system of most vertebrates in response to challenges by foreign agents such as viruses, bacteria, parasites and tumor cells.
- 53 _____s are a family of small, signaling proteins and glycoproteins particularly important in both innate and adaptive immune responses.
- 54 The _____ pathway of activation of the complement system is a group of blood proteins that mediate the specific antibody response, triggered by the binding of a specific part of the antibody molecule to the C1 component.
- 55 _____ antibodies are antibodies that are derived from different B-cell lines.
- 57 A [_____] determining region is a short amino acid sequence found in the variable domains of antigen receptor proteins that complements an antigen.
- 58 _____ signalling is a form of hormonal signalling in which a cell secretes a hormone, or chemical messenger, that binds to receptors on the same cell.
- 60 _____s are the most abundant type of white blood cells, phagocytes that quickly congregate at a focus of infection, attracted by cytokines expressed by activated endothelium, mast cells and macrophages.
- 61 A _____ T cell belongs to a sub-group of T lymphocytes which are capable of inducing the death of infected somatic or tumor cells.
- 63 _____'s patches are secondary lymphoid organs which are aggregations of lymphoid tissue usually found in the lowest portion of the small intestine in humans
- 64 Lymph _____s are thin walled, valved structures that carry lymph.
- 66 Immune _____ is the process by which the immune system does not attack an antigen.
- 67 An _____ is a shared characteristic between a group of immunoglobulin or T cell receptor molecules based upon the antigen binding specificity and therefore structure of their variable region.
- 68 A _____ chain is the large polypeptide subunit of an antibody.
- 71 The major _____ complex (MHC) is a large gene family found in most vertebrates, the most gene-dense region of the mammalian genome, which plays an important role in the immune system, autoimmunity, and reproductive success.
- 74 The _____ system is a biochemical cascade which helps clear pathogens from an organism consisting of a number of small proteins found in the blood, normally circulating as inactive zymogens.
- 76 The _____ is an organ located in the upper anterior portion of the chest cavity just behind the sternum. It is of central importance in the maturation of T cells.
- 77 _____ cells are cells of the immune system that secrete large amounts of antibodies.
- 78 An _____ is any molecule that acts as a binding enhancer for the process of phagocytosis, for example, by coating the negatively-charged molecules on the membrane.
- 79 _____s are short lived endogenously produced eicosanoids whose appearance in inflammation signals the resolution of inflammation.
- 80 _____-macrophage colony-stimulating factor (GM-CSF) is a cytokine that functions as a white blood cell growth factor. It is secreted by macrophages, T cells, mast cells, endothelial cells and fibroblasts.

DOWN

- 2 A primary classes of major histocompatibility complex molecules, _____ class I molecules are found on almost every nucleated cell of the body.
- 4 A _____ can be any structure barely visible by light microscopy. The term is most often used to describe a secretory vesicle.
- 5 _____s are exogenous serine proteases released by cytoplasmic granules within cytotoxic T cells and natural killer cells.
- 6 _____s are a family of small cytokines characterized by the presence of four cysteine residues in conserved locations that are key to forming their 3-dimensional shape.
- 7 A _____ chain is the small polypeptide subunit of an antibody.
- 8 An _____ or immunogen is a molecule that stimulates an immune response.
- 10 A _____ is any member of a group of lipid compounds containing 20 carbon atoms, including a 5-carbon ring, which are derived enzymatically from fatty acids and have important functions in the animal body.
- 13 _____s are signaling molecules derived from omega-3 or omega-6 fats. They exert complex control over many bodily systems, especially in inflammation, immunity and as messengers in the central nervous system.
- 14 Natural _____ cells are a form of cytotoxic lymphocyte which constitute a major component of the innate immune system.
- 15 _____s are a category of white blood cells characterised by the presence of granules in their cytoplasm.
- 18 The _____ system is a complex network of lymphoid organs, lymph nodes, lymph ducts, tissues, lymph capillaries and lymph vessels that produce and transport lymph fluid from tissues to the circulatory system.
- 19 The _____ is an organ located in the abdomen of the human body, where it carries out immune functions as well as functions concerned with the destruction of old red blood cells.
- 20 Respiratory _____ is the rapid release of reactive oxygen species from different types of cells.
- 21 Major _____ protein is a 117-residue protein that predominates in eosinophil granules which is a potent enzyme against helminths and is toxic towards bacteria and mammalian cells in vitro.
- 26 _____ signaling is a form of cell signaling in which the target cell is close to the signal releasing cell.
- 28 A _____ is a leukocyte that protects against blood-borne pathogens and moves quickly to sites of infection in the tissues. These cells are identified in stained smears by their large bilobate nucleus.
- 33 V(D)J _____ is a mechanism that occurs in vertebrates to randomly selects and assembles segments of genes encoding specific proteins with important roles in the immune system.
- 35 The _____ immune system comprises the cells and mechanisms that defend the host from infection by other organisms, in a non-specific manner.
- 36 An _____ is the part of a macromolecule that is recognized by the immune system, specifically by antibodies, B cells, or T cells.
- 37 The least common of the granulocytes, _____s degranulate to release histamine, the proteoglycans heparin and chondroitin, and proteolytic enzymes.
- 39 The _____ immune response provides the vertebrate immune system with the ability to recognize and remember specific pathogens.
- 40 The _____ duct is the largest lymphatic vessel in the body, collecting most of the lymph in the body and draining into the systemic circulation at the left subclavian vein
- 42 _____/delta T cells represent a small subset of T cells that possess a distinct type of T cell receptor (TCR) on their surface.
- 45 _____ connective tissue is a type of loose irregular connective tissue with a network of fibers that form a soft skeleton to support lymphoid organs such as lymph nodes, red bone marrow, thymus, and spleen.
- 47 An _____ is an antibody manufactured by the immune system that is directed against one or more of the individual's own proteins.
- 50 The _____ system consists of the phagocytic cells located in reticular connective tissue, primarily monocytes and macrophages.
- 52 _____ is the complex biological response of vascular tissues to harmful stimuli, such as pathogens, damaged cells, or irritants.
- 56 Lymph _____s are components of the lymphatic system that contain white blood cells and act as filters or traps for foreign particles.
- 59 Leukocyte _____ refers to the movement of leukocytes from the circulatory system into the interstitial fluid, towards the site of tissue damage or infection.
- 62 An immunoglobulin _____ is the allele of the antibody chains found in the individual.
- 65 A cytokine _____ is a potentially fatal immune reaction consisting of a positive feedback loop between cytokines and immune cells.
- 69 _____ T cells, sometimes known as suppressor T cells, act to suppress activation of the immune system and thereby maintain immune system homeostasis and tolerance to self-antigens.
- 70 A _____ cell is a resident cell of several types of tissues and contains many granules rich in histamine and heparin.
- 72 _____ cells are specialized macrophages located in the liver that form part of the reticuloendothelial system whose primary function is to recycle old red blood cells that no longer are functional.
- 73 The immunoglobulin _____ refers to the type of chain of an antibody.
- 74 Not involving antibodies, _____-mediated immunity is an immune response involving the activation of macrophages, natural killer _____s, cytotoxic T-lymphocytes, and the release of various cytokines in response to an antigen.
- 75 _____ blood cells or leukocytes are cells of the immune system which defend the body against both infectious disease and foreign materials.