

IMMUNOLOGY MULTIPLE CHOICE QUESTIONS WITH ANSWERS AND EXPLANATION

LIPPINCOTT CHAPTER 1 MULTIPLE CHOICE QUESTIONS: NEED FOR SELF RECOGNITION

1. Immune recognition of molecules belonging to self is important to

- A. activate natural killer cells of the innate immune system.
- B. determine the safety of interacting with the molecule.
- C. induce somatic generation of a B- or T-lymphocyte receptor for the molecule.
- D. stimulate binding by pattern recognition receptors.
- E. trigger an attack on the cell expressing the self molecule

The correct answer is B. Identification of self tells the immune system that the cell or molecule recognized is not a foe. Natural killer cells use this mechanism of self-recognition to halt their attack on cells that they perceive to be abnormal. Receptor generation by B and T cells occurs independently of initial encounter with self molecules. Pattern recognition receptors, on the other hand, are genetically programmed to recognize nonself. By triggering an attack on a cell expressing the self molecule, an immune recognition molecule violates its "nonaggression pact" with the cells and molecules of the host and establishes an internal coup known as autoimmunity.

2. Natural killer cells assess whether other cells are abnormal by detecting types and levels of surface-associated

- A. MHC class I molecules.
- B. nonself molecules.
- C. pathogen-associated molecular patterns.
- D. pattern recognition receptors.
- E. somatically generated cell surface receptors.

The correct answer is A. MHC class I molecules are self-identification molecules found on all nucleated host cells. Natural killer cells, after making contact with cells expressing stress signals, make the decision whether to kill them or not by assessing whether they express the appropriate types and levels of MHC I molecules. Although they are members of the innate immune system, natural killer cells do not recognize nonself, pathogen-associated molecular patterns, or pattern recognition receptors. Natural killer cells are unable to recognize somatically generated cell surface receptors.

3. Pattern recognition receptors bind to

- A. B and T lymphocytes.
- B. host cell-associated molecules.
- C. MHC I molecules.
- D. natural killer cells.
- E. pathogen-associated molecular patterns.

The correct answer is E. Pattern recognition receptors (PARs) are genomically determined to bind to molecules widely expressed by microbes but not by host cells. Consequently, PARs cannot recognize host-associated molecules such as MHC class I molecules or cells of host origin such as B, T, or natural killer lymphocytes.

4. Somatically generated receptors found on B and T lymphocytes are

- A. bound only to MHC I molecules.

- B. encoded in the germline to recognize pathogen-associated molecular patterns.
- C. first produced after an initial encounter with nonself.
- D. identical among individuals.
- E. randomly generated during development.

The correct answer is E. Bone marrow-derived (B) and thymus-derived (T) lymphocytes somatically generate receptors during development. Unlike natural killer cells, B cells and T cells are unable to assess the quantity of MHC class I molecules on nucleated cells. Unlike innate immune system receptors, B- and T-lymphocyte somatic receptors are randomly generated and vary greatly between individuals. B- and T-lymphocyte receptors are formed prior to antigen stimulation.

5. Immunologic memory refers to

- A. activation of phagocytic cells to ingest microbial invaders.
- B. changes in adaptive immune responses with subsequent encounters with antigen.
- C. constancy of the response of the innate immune response to a particular microbe.
- D. recognition of pathogen-associated molecular patterns by pattern recognition receptors.
- E. stimulating a defective host cell with reduced MHC I molecules to commit suicide.

The correct answer is B. A hallmark of the adaptive immune system is that it progressively alters its response upon reexposure to an antigenic stimulus, and in doing so, it must recall the previous exposure, a process known as memory. Although they are members of the innate immune system and do not possess immunologic memory, phagocytes may be influenced by the adaptive immune system. Consistency in immune response from initial to subsequent encounters is a hallmark of the innate immune response. Immunologic memory of the adaptive immune system is not passed genetically from one generation of individuals to the next. Detection of diminished MHC class I expression is a function of natural killer cells, members of the innate immune system.

6. Influenza viruses infect humans and elicit an immune response that is often insufficient to protect the individual from sickness or death. Which of the following structures are on influenza viruses, allowing them to be recognized by the human immune system?

- A. MHC I molecules
- B. MHC II molecules
- C. Pathogen-associated molecular patterns
- D. Pattern recognition receptor
- E. Somatic generated receptors

The correct answer is C. The molecules on the virus that are not on host cells are the pathogen-associated molecular patterns. The pattern recognition receptors are found on host cells and molecules. MHC I and II molecules are present on all nucleated host cells but not on viruses. The somatically generated receptors are on host T and B lymphocytes.