

Immunology Quiz Questions and Answers PDF

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Which cell type is primarily responsible for producing antibodies?

- T Cells
- B Cells ✓**
- Macrophages
- Neutrophils

The primary cell type responsible for producing antibodies is the B cell, which is a crucial component of the adaptive immune system. Upon activation, B cells differentiate into plasma cells that secrete antibodies to help neutralize pathogens.

Which of the following are types of vaccines? (Select all that apply)

- Live-attenuated ✓**
- Inactivated ✓**
- Subunit ✓**
- Antibiotic

Vaccines can be categorized into several types, including live attenuated, inactivated, subunit, and mRNA vaccines. Each type works differently to stimulate the immune response and provide protection against diseases.

What role do cytokines play in the immune system? Provide examples.

Cytokines play a critical role in the immune system by facilitating communication between cells, regulating immune responses, and orchestrating inflammation. Examples include interleukins

(IL-1, IL-6), interferons (IFN- α , IFN- β), and tumor necrosis factor (TNF- α).

Discuss the concept of herd immunity and its significance in public health.

Herd immunity occurs when a large percentage of a population becomes immune to an infectious disease, thereby reducing its spread and protecting those who are not immune. This concept is significant in public health as it helps to control and potentially eradicate diseases, ensuring community safety and health.

Which of the following is a characteristic of innate immunity?

- Memory response
- Specificity to antigens
- Immediate response ✓
- Delayed response

Innate immunity is characterized by its immediate response to pathogens and its non-specific nature, meaning it does not target specific pathogens but rather provides a general defense against a wide range of invaders.

Which class of MHC molecules is found on all nucleated cells?

- Class I ✓
- Class II
- Class III
- Class IV

Class I MHC molecules are present on all nucleated cells, playing a crucial role in the immune response by presenting endogenous antigens to CD8+ T cells.

Which cells are part of the adaptive immune system? (Select all that apply)

- T Cells ✓
- B Cells ✓

- Neutrophils
- Dendritic Cells

The adaptive immune system primarily consists of T cells and B cells, which are responsible for specific immune responses and memory against pathogens.

Which mechanisms do pathogens use to evade the immune system? (Select all that apply)

- Antigenic variation ✓
- Inhibition of complement activation ✓
- Phagocytosis
- Suppression of immune response ✓

Pathogens employ various strategies to evade the immune system, including antigenic variation, immune suppression, and hiding within host cells. These mechanisms allow them to persist and cause disease despite the host's immune responses.

Which cells are involved in antigen presentation? (Select all that apply)

- Macrophages ✓
- Dendritic Cells ✓
- B Cells ✓
- Red Blood Cells

Antigen presentation is primarily carried out by professional antigen-presenter cells (APCs) such as dendritic cells, macrophages, and B cells. These cells process and present antigens to T cells, initiating an immune response.

What is the primary function of natural killer (NK) cells?

- Produce antibodies
- Present antigens
- Destroy infected or cancerous cells ✓
- Activate T cells

Natural killer (NK) cells are a type of lymphocyte that play a crucial role in the immune system by identifying and destroying infected or cancerous cells without prior sensitization. They are essential for the body's innate immune response.

Which cytokine is known for its antiviral properties?

- Interleukin-2
- Interferon ✓**
- Tumor Necrosis Factor
- Interleukin-10

Interferons are a group of cytokines that play a crucial role in the immune response against viral infections. They help to inhibit viral replication and activate immune cells to enhance the antiviral response.

Explain the difference between innate and adaptive immunity.

Innate immunity is the immediate, non-specific defense mechanism present at birth, including barriers like skin and immune cells like macrophages. In contrast, adaptive immunity is a specific response that develops after exposure to a pathogen, involving lymphocytes (such as B and T cells) and the formation of immunological memory.

Which of the following is a primary lymphoid organ?

- Spleen
- Lymph Node
- Thymus ✓**
- Tonsils

The primary lymphoid organs are responsible for the development and maturation of lymphocytes. The thymus and bone marrow are the main examples of primary lymphoid organs.

Which of the following are functions of antibodies? (Select all that apply)

- Neutralization of pathogens ✓**
- Opsonization ✓**
- Antigen presentation
- Activation of complement system ✓**

Antibodies play crucial roles in the immune response, including neutralizing pathogens, opsonization for enhanced phagocytosis, and activating the complement system.

Describe the process of clonal selection and expansion in the adaptive immune response.

When an antigen enters the body, it binds to specific receptors on B or T cells that recognize it. This binding activates the lymphocytes, leading to their clonal expansion, where they proliferate and differentiate into effector cells (such as plasma cells for B cells or cytotoxic T cells) that can effectively eliminate the pathogen.

How does the body achieve immune tolerance, and why is it important?

The body achieves immune tolerance through processes like central tolerance, where self-reactant T cells are eliminated in the thymus, and peripheral tolerance, where regulatory T cells suppress immune responses to self-antigens. This is important to prevent autoimmune diseases and ensure the immune system does not attack the body's own cells.

Which of the following is NOT a type of hypersensitivity reaction?

- Type I
- Type II
- Type III
- Type V ✓

Hypersensitivity reactions are classified into four types: Type I (immediate), Type II (cytotoxic), Type III (immune complex-mediated), and Type IV (cell-mediated). Any option that does not fit into these classifications is not a type of hypersensitivity reaction.

What type of immunity is provided by vaccines?

- Innate Immunity
- Passive Immunity
- Adaptive Immunity ✓
- Autoimmunity

Vaccines provide acquired immunity by stimulating the immune system to recognize and fight specific pathogens without causing the disease. This type of immunity is often long-lasting and can be enhanced through booster shots.

Which of the following are autoimmune diseases? (Select all that apply)

- Rheumatoid Arthritis ✓
- Lupus ✓
- Asthma
- Type 1 Diabetes ✓

Autoimmune diseases occur when the immune system mistakenly attacks the body's own tissues. Common examples include rheumatoid arthritis, lupus, and multiple sclerosis.

What are the main challenges in developing vaccines for rapidly mutating viruses like influenza?

The main challenges in developing vaccines for rapidly mutating viruses like influenza include the virus's ability to change its surface proteins frequently, making it difficult to create a long-lasting vaccine, and the need for timely updates to the vaccine formulation to match the most prevalent strains.