

Документ подписан простой электронной подписью  
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## ASSESSMENT MATERIALS FOR CURRENT AND INTERIM CERTIFICATIONS IN THE DISCIPLINE

### Immunology and allergology

Code, direction of preparation	05.31.01 General Medicine
Directivity (profile)	General Medicine
Form of study	Full-time
Department-developer	PATHOPHYSIOLOGY AND GENERAL PATHOLOGY
Graduate department	INTERNAL DISEASES

### TYPICAL TASKS FOR THE CONTROL WORK 7<sup>th</sup>, 8<sup>th</sup> semester

Examples of problems with standard answers

Task No. 1. The local pediatrician was called to see a sick 6-year-old child. The child complains of high temperature, general weakness, headache, sore throat when swallowing. When examining the child, the doctor noted: there was a pale nasolabial triangle on the face, a pinpoint bright red rash on the skin of the abdomen, buttocks, and the inner surfaces of the arms and legs, the tongue was bright red, the tonsils were enlarged and hyperemic. The doctor made a preliminary diagnosis: Scarlet fever.

Exercise:

1. Name the antigen (pathogen) that caused the disease - scarlet fever, indicate its taxonomic position.
2. Indicate the types and types of immune response that occur in response to this antigen (pathogen).

Answer:

1. The causative agent is group A  $\beta$ -hemolytic streptococcus.
2. Type of immune response – specific and nonspecific, type – cellular and humoral.

Task No. 2. Describe changes in secretory IgA levels in breast milk. Present the result in the form of a table.

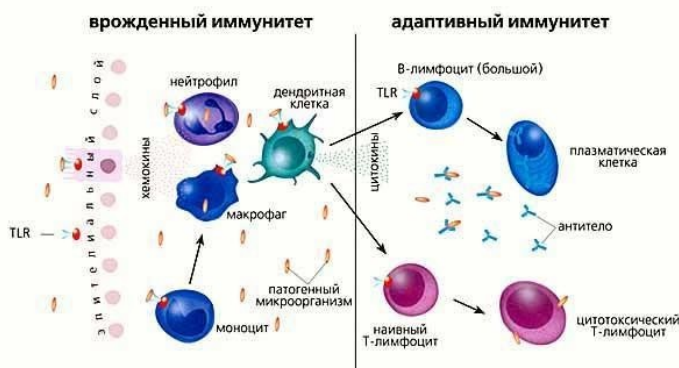
Answer: Colostrum 2-3 days after birth, maximum sIgA level is 12-16 mg/ml

Transitional milk 6-7 days the level quickly decreases and by the end of the first - beginning of the second week it stabilizes at 0.6-1 mg/ml

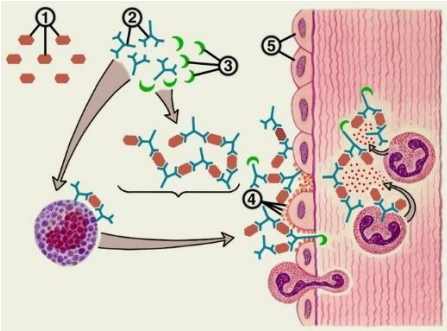
Mature milk 2nd week sIgA concentration is retained in mature milk for 8-9 months. With repeated feeding, 600-1000 mg of sIgA enters the child's body daily

Task No. 3. Schematically show the relationship between the types and types of immune response.

Answer:



Task No. 4. Based on the diagram of the first phase of the inflammatory process, describe the components involved in it.



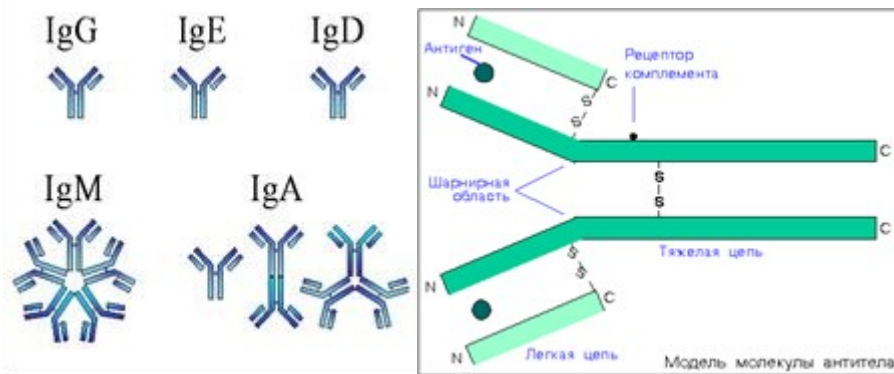
Answer:

1. Antigen.
2. Antibodies.
3. Complement.
4. Receptors on the surface of phagocytic cells.
5. Phagocytic cells

Task No. 5. Draw a diagram of the structure of immunoglobulin A, G, M, secretory immunoglobulin.

Exercise:

1. Indicate the structural elements of a protein on the diagram.
2. Indicate in the figure the zone that determines the spatial conformation of the immunoglobulin molecule, variable and constant fragments



### SAMPLE QUESTIONS FOR THE CREDIT (7th semester)

1. Characterize the immune system and describe the types of its response and their relationship. Describe the main principles of the functioning of the immune system, the purpose and conditions necessary for the functioning of the immune system.
2. Describe nonspecific protection factors and briefly characterize them. Describe the inflammatory factor. Describe the stages of phagocytosis. Describe phagocytic cells.
3. Give characteristics to the periods of ontogenesis of the immune system.
4. Describe the factors that ensure the relationship between mother and fetus during pregnancy. Describe the mother's tolerance to the fetus during pregnancy.
5. Characterize the stages of ontogenesis of the immune system in the postnatal period. Describe the features of the immune system during these periods.
6. Characterize the immune factors of breast milk and the features of changes in the content of immunoglobulins in it.
7. Describe the cellular and humoral factors of specific and nonspecific protection at the site of inflammation.
8. Give the concept of “insufficiency of the immune system” or “immune deficiency”. Name the reasons for the ineffective functioning of the immune system.
9. Immunodeficiency states. Classification.

10. Types of allergic reactions. Classification. Features of the formation of autoimmune reactions.
11. Groups of autoimmune diseases. Relationship with types of allergic reactions.
12. Serum sickness. Etiology. Clinical manifestations.
13. Describe populations of lymphocytes, their brief characteristics and role in specific and nonspecific immune responses.
14. Neutrophils and their central role in the immune response. Ways to destroy antigen.
15. Describe the factors that make up the humoral component of immunity.
16. Immunoglobulins and their role in the immune response. Structure and structure using the example of an IgG molecule . Properties of AT, their characteristics. Characteristics of immunoglobulin classes.
17. Characteristics of complement. Role in the immune response. Pathways of complement activation.
18. Characteristics of cytokines. Role in the immune response.
19. Describe laboratory methods for diagnosing antigens and immunoglobulins.
20. The concept of antigen. Types of immune response to antigens. Properties of antigen, their characteristics. Characteristics of differentiation leukocyte antigens. Characteristics of antigens of the HLA system . Location, classes, loci and subloci.
21. Transplantation immunity. Types of transplant immunity. Features of the immune response during various types of transplantation. Stages of tissue rejection during transplantation according to the direction of the immune response and the speed of manifestation.
22. Methods for identifying specific sensitization to allergens. Their brief description.
23. Characteristics of drugs based on AT, mCAT. Mechanism of action, main indications for use, disadvantages of drugs based on them.
24. Characteristics of treatment methods based on the use of hypertension. Types of vaccines: according to composition, activity of the carrier antigen. Characteristics of vaccine preparations of bacterial or ribosomal origin.
25. Characteristics of drugs based on allergens. Composition, indications and contraindications for use. The concept of antiallergic immunotherapy. Expected clinical effectiveness of ASIT. Methods of administration. Advantages of non-injection forms of ASIT.
26. The concept of vaccination according to the vaccination calendar. The concept of vaccine prevention for epidemic indications. Purpose and indications for vaccines. Contraindications. The concept of adverse reactions and complications that occur during vaccination.

### **SAMPLE TASKS FOR THE CREDIT (8th semester)**

Task No. 1. The local pediatrician was called to see a sick 6-year-old child. The child complains of high temperature, general weakness, headache, sore throat when swallowing. When examining the child, the doctor noted: there was a pale nasolabial triangle on the face, a pinpoint bright red rash on the skin of the abdomen, buttocks, and the inner surfaces of the arms and legs, the tongue was bright red, the tonsils were enlarged and hyperemic. The doctor made a preliminary diagnosis: Scarlet fever.

Exercise:

1. Name the antigen (causative agent) that caused the disease - scarlet fever, indicate its taxonomic position.

2. Indicate the properties of the antigen (pathogen) and indicate which of them plays a role in the development of the disease and the reactivity of the immune system.

3. Indicate the types and types of immune response that occur in response to this antigen (pathogen).

Task No. 2. Draw a diagram of the steps of chemotaxis and phagocytosis.

Assignment: Name the distinctive stages of phagocytosis of a neutrophil and a monocyte, a dendritic cell.

Task No. 3. Draw a diagram of the classical complement activation pathway.

Exercise:

1. Name the distinctive features of the classical and alternative pathways of complement activation.

2. Name similar features of the classical and alternative pathways of complement activation.

Task No. 4. Draw a diagram of the structure of the major histocompatibility complex - genes encoding MHC I and MHC II molecules.

Exercise:

1. Name the localization of these genes.

2. Name the loci and subloci of the MHC I and MHC II classes.

3. Describe the conditions under which MHC genes are studied.

Task No. 5. Draw a diagram of the structure of immunoglobulin G, M, secretory immunoglobulin.

Exercise:

1. Name the properties of immunoglobulins and indicate on the diagram the areas that determine them.

2. Indicate in the figure the zone that determines the spatial conformation of the immunoglobulin molecule.

3. Indicate the classes of immunoglobulins, their similarities and differences in structure.

Task No. 6. Draw a diagram of the enzyme immunoassay.

Exercise:

1. Describe the phenomenon of this method.

2. Characterize the objects that this method allows you to define.

3. Indicate the disadvantages and advantages of this method.

Task No. 7. Draw a diagram of the turbidimetric method.

Exercise:

1. Describe the phenomenon of this method.

2. Characterize the objects that this method allows you to define.

3. Indicate the disadvantages and advantages of this method.

4. Name the difference between this method and nephelometry.

Task No. 8. Draw a diagram of flow cytometry .

Exercise:

1. Describe the phenomenon of this method.
2. Characterize the objects that this method allows you to define.
3. Indicate the disadvantages and advantages of this method.
4. Name the difference between this method and fluorometry .

Task No. 9. Draw a diagram of the mechanism of type I hypersensitivity?

Exercise:

1. Based on the diagram, describe the phases of development of type I hypersensitivity reaction.
2. Name the factors that initiate type I hypersensitivity reactions.
3. Name the diseases in the pathogenesis of which type I hypersensitivity reactions play a role.

Task No. 10. Draw a diagram of the mechanism of type II hypersensitivity?

Exercise:

1. Based on the diagram, describe the phases of development of type II hypersensitivity reaction.
2. Name the factors that initiate type II hypersensitivity reactions.
3. Name the diseases in the pathogenesis of which type II hypersensitivity reactions play a role.

Task No. 11. Draw a diagram of the mechanism of type III hypersensitivity?

Exercise:

1. Based on the diagram, describe the phases of development of type III hypersensitivity reaction.
2. Name the factors that initiate type III hypersensitivity reactions.
3. Name the diseases in the pathogenesis of which type III hypersensitivity reactions play a role.

Task No. 12. Draw a diagram of the mechanism of type IV hypersensitivity?

Exercise:

1. Based on the diagram, describe the phases of development of type IV hypersensitivity reaction.
2. Name the factors that initiate type IV hypersensitivity reactions.
3. How does this type of reaction differ from other types.
4. Name the diseases in the pathogenesis of which type IV hypersensitivity reactions play a role.

Task No. 13. Draw a diagram of the mechanism of type V hypersensitivity?

Exercise:

1. Based on the diagram, describe the phases of development of type V hypersensitivity reaction.
2. Name the factors that initiate type V hypersensitivity reactions.
3. Name the diseases in the pathogenesis of which type V hypersensitivity reactions play a role.