Ministry of Health Care, Republic of Belarus
Vitebsk State Medical University
Department of Clinical Microbiology

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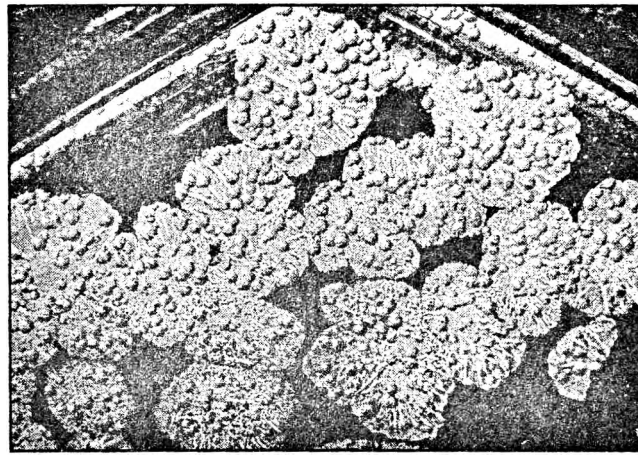
TESTS

ON

MEDICAL MICROBIOLOGY



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Test book on medical microbiology comprises a broad number of multiple choice questions ccvering the whole course of medical microbiology, virology and immunology. Tests are prepared according to basic educational plan and program, approved by Ministry of Education and Ministry of Health Care of Republic of Belarus. The book encompasses all basic sections of the subject – General Microbiology, Medical Immunology, Medical Bacteriology and Virology.

The edition is assigned for medical students of high educational establishments.

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Section 1.
General Microbiology

1. Choose the microbial taxonomic unit corresponding to domain level:

1. Protozoa
2. Fungi
3. Bacteria+
4. Proteobacteria
5. Chlamydia

2. Polyphasic taxonomy grounds on:

1. Phylogenetic relationships among bacterial groups
2. Genetic analysis of bacteria including DNA-DNA hybridization and ribotyping
3. Specific protein and enzyme patterns of bacteria
4. Specified number of phenotypic traits
5. All above listed is relevant+

3. Current method providing classification of bacteria at genus or family rank:

1. DNA-DNA hybridization
2. Ribotyping+
3. Microscopy with differential stains
4. Identification of chemical composition of bacteria (chemotaxonomic markers)
5. Full description of expressed features (morphology and physiology, antigenic structure of bacteria, etc.)

4. Vaccine, created by L. Pasteur:

1. Against tuberculosis
2. Against influenza
3. Against plague
4. Against rabies+
5. Against plague

5. "Genle-Koch's triad" formulates:

1. Conditions for epidemic process development
2. Basic principles that prove infectious origin of the disease+
3. Basic principles of asepsis
4. Principles of laboratory testing in microbiology
5. Basic three-domain organization of microbial world

6. Highest taxonomic rank from iisted below:

1. Order
2. Class+
3. Family
4. Genus
5. Pathovar

7. Bacterial strain is:

1. Population of bacteria of the same species inhabiting common area
2. Population of bacteria that exert the same pathology
3. Population of bacteria of the same species isolated from various sources
4. Population of bacteria of the same species isolated from various sources or from the same source at different periods of time+
5. Population of bacteria with closely similar genomic features

8. Biovar of bacteria means:

1. Group of bacteria sharing biochemical features with other bacteria:
2. Bacteria with common metabolic pathways
3. Group of the same species bacteria with common special biochemical or physiologic properties+
4. Bacteria living in the same biotope
5. Various bacteria forming common biofilm

9. Resolving power of light microscope is determined by:

1. Wavelength of light
2. Light wave frequency
3. Refraction index of medium
4. Wavelength of carrier light and numeric aperture of objective lens+
5. Overall magnification of objective and ocular lenses

10. Microscopical technique allowing the formation of 3D-like relief image of cells:

1. Bright field microscopy
2. Dark field microscopy
3. Fluorescent microscopy
4. Phase contrast microscopy
5. Differential interference contrast (DIC) light microscopy+

11. Light microscopical technique for real-time observation of living bacteria:

1. Phase contrast microscopy+
2. Bright field transmission light microscopy – simple stain
3. Bright field microscopy – differential stain
4. Transmission electron microscopy
5. Scanning electron microscopy

12. This taxonomic group of microorganisms is not presented in domain organization:

1. Vira+
2. Bacteria
3. Archaea
4. Eucarya
5. All are presented

13. Numerical taxonomy is primarily based on:

1. Morphology of bacteria
2. Multiple biochemical markers
3. Sequencing of bacterial genomes
4. Antigenic structure
5. Computer-assisted analysis of all traits of bacterial population+

14. Current method providing classification of bacteria on species level:

1. Electron microscopy
2. Identification of chemical composition of bacteria (chemotaxonomic markers)
3. Full description of expressed features of bacteria (morphology and physiology, antigenic structure, etc.)
4. DNA-DNA hybridization+
5. Ribotyping

15. Pandemic bacterium, discovered by R. Koch:

1. *Streptococcus pyogenes*
2. *Neisseria gonorrhoea*
3. *Corinebacterium diphteriae*
4. *Vibrio cholerae*+
5. *Yersinia pestis*

16. Choose incorrect statement:

1. Paul Ehrlich was the first who introduced chemical drugs for infectious disease treatment
2. Ilya Metchnikoff discovered phagocytosis
3. Alexander Fleming discovered sulfonamides+
4. Ignaz Semmelweis formulated first principles of asepsis
5. Joseph Lister demonstrated high efficacy of antiseptics in prevention of wound infections

17. These features are essential for species in bacteria except:

1. Common origin
2. Evolutionary stable genomic organization+
3. Genomic DNA relatedness at 70% or more
4. Similar or common area of habitation
5. Similar properties

18. Pathovar of bacteria means:

1. Various bacteria isolated from patients with certain disease
2. Various bacteria producing similar toxins or other virulence factors
3. Degraded morphological form of bacteria
4. Bacteria of the same species with equal spectra of antibiotic resistance
5. Bacteria of the same species demonstrating equal pathogenic properties for certain hosts+

19. Total magnification of light microscopes is calculated as:

1. Magnification of objective lens multiplied by magnification of eyepiece lens+
2. Magnification of objective lens multiplied by magnification of condenser and eyepiece lens
3. Overall magnification of objective and eyepiece lenses divided by focal length
4. Total sum of objective, eyepiece and condenser lens magnifications
5. Total sum of objective and eyepiece lenses multiplied by power coefficient of light source

20. Microscopical technique that creates true 3D-image of bacteria:

1. Differential interference contrast (DIC) microscopy
2. Laser scanning confocal microscopy+
3. Fluorescent microscopy
4. Phase contrast microscopy
5. Transmission electron microscopy

21. Microscopical technique allowing real-time analysis of microbial surface on nanoscale level:

1. Atomic force microscopy+
2. Transmission electron microscopy
3. Differential interference contrast (DIC) microscopy
4. Laser scanning confocal fluorescent microscopy
5. Immune fluorescent microscopy

22. Microscopical technique with highest resolving power:

1. Differential interference contrast (DIC) microscopy
2. Scanning electron microscopy
3. Transmission electron microscopy+
4. Laser scanning confocal microscopy
5. Fluorescent microscopy

23. Obligate structure of bacterial cell

1. Spore
2. Cell wall
3. Nucleoid+
4. Flagella
5. Granules of volutin

24. Non-obligate structure of bacterial cell

1. Spore+
2. Ribosome
3. Cytoplasm
4. Nucleoid
5. Cytoplasmic membrane

25. A method of studying of bacterial morphology

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2. Serological testing
3. Genetic identification
4. Preparation of smears with simple method of stain+
5. Biochemical reactions

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2. Prevention of capsule synthesis
3. Osmotic shock
4. Impairment of cell wall synthesis due to transpeptidase inhibition+
5. Dampening of protein synthesis

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3. Plasmids
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5. Flagella+

28. Structures for adhesion of bacteria

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2. Mesosomes
3. Fibrils
4. Pili+
5. Plasmids

29. Spore-forming microorganisms:

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4. Pseudomonads
5. Mycobacteria

30. Morphology of streptococci

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2. Paired cocci
3. Tetrade-forming cocci
4. Cocci, lying separately from each other
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2. Nucleoid
3. Spore
4. Lipid A+
5. Inner membrane

33. Structure for protection of bacterial cells against macrophages

1. Flagella
2. Cytoplasmic membrane
3. Granules of volutin
4. Capsule+
5. Ribosomes

34. A method for acid-fast bacilli stain

1. Gram
2. Neisser
3. Ziehl-Neelsen+
4. Romanowsky-Giemsa
5. Acridine orange

35. A method for stain of volutin granules

1. Gram
2. Neisser+
3. Ziehl-Neelsen
4. Romanowsky-Giemsa
5. Fuchsin

36. The round (spherical) forms of bacteria

1. Bacilli
2. Mycobacteria
3. Clostridia
4. Spirochetes
5. Diplococci+

37. Spiral forms of microorganisms:

1. Bacilli
2. Spirochetes+
3. Staphylococci
4. Actinomycetes
5. Mycobacteria

38. Spore-forming microorganisms:

1. Bacilli+
2. Spirochetes
3. Staphylococci
4. Bacteroids
5. Mycobacteria

39. Morphology of staphylococci:

1. Chains of cocci
2. Paired cocci
3. Tetrade-forming cocci
4. Cocci, lying separately from each other
5. Grapes-like cocci+

40. Rod-shaped forms of microorganisms:

1. Bacilli+
2. Spirochetes
3. Staphylococci
4. Actinomycetes
5. Borrelia

41. Filamentous or branched forms of microorganisms:

1. Bacilli
2. Vibrios
3. Streptococci
4. Actinomycetes+
5. Clostridia

42. A component of bacterial envelope:

1. Flagella
2. Nucleoid
3. Spore
4. Pili
5. Cell wall+

43. L-form of bacteria means:

1. Bacteria without capsule
2. Lamellar bacterial form
3. Non-replicating dormant bacteria
4. LPS-containing bacteria
5. Bacteria without cell wall able to self-replication+

44. Components of envelope present solely in gram-positive bacteria:

1. Inner membrane
2. Peptidoglycan
3. LPS
4. Teichoic acids +
5. Outer membrane

45. Obligate intracellular parasites:

1. Mycoplasmas
2. Actinomycetes
3. Chlamydiae+
4. Spirochetes
5. Vibrios

46. Microorganisms without cell wall:

1. Rickettsiae
2. Mycoplasmas+
3. Chlamydiae
4. Spirochetes
5. Staphylococci

47. For fungi is typical:

1. Presence of nucleus+
2. Presence of nucleoid
3. Presence of flagella
4. Presence of teichoic acids
5. Absence of cell wall

48. Reproduction by means of spores:

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3. Fungi+
4. Mycoplasmas
5. Bacilli

49. Organelles of locomotion of spirochetes:

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2. Fibrillas+
3. Mesosomes
4. Pili
5. Cytoplasmic protrusions

50. Representatives of spiral microbial forms:

1. Actinomycetes
2. Borrelia+
3. Mycoplasmas
4. Chlamydiae
5. Fungi

51. The sexual method of reproduction is characteristic for:

1. Treponema
2. Actinomycetes
3. Ascomycetes+
4. Chlamydiae
5. Mycoplasmas

52. Beta-lactam antibiotics don't inhibit:

1. Mycoplasmas+
2. Rickettsiae
3. Meningococci
4. Treponema
5. Borrelia

53. Pseudo-mycelium (pseudohyphae) is formed by:

1. Ascomycetes
2. Basidiomycetes
3. Candidae+
4. Actinomycetes
5. Mycoplasmas

54. A method of stain for spirochetes:

1. Romanovsky-Giemsa+
2. Ozheshko
3. Gins
4. Ziehl-Neelsen
5. Gram

55. Ascus can be present in:

1. Mucor
2. Penicillium+
3. Microsporum
4. Basidiomycetes
5. Trichophyton

56. Obligate intracellular parasites:

1. Staphylococci
2. Mycoplasmas
3. Rickettsiae+
4. Spirillas
5. Spirochetes

57. Essential part of envelope in mycoplasmas?

1. Capsule
2. Peptidoglycan
3. LPS
4. Cell wall
5. Cytoplasmic membrane+

58. Microorganisms having nucleus:

1. Actinomycetes
2. Spore-forming bacilli
3. Chlamydiae
4. Mycoplasmas
5. Yeasts+

59. Fungi are reproduced by:

1. Nucleoid
2. Nucleosomes
3. Conidia+
4. Mesosomes
5. Sterigmata

60. Cholesterol is essential for growth of:

1. Rickettsiae
2. Mycoplasmas+
3. Clostridia
4. Chlamydiae
5. Fungi

61. The method of reproduction absent in deuteromycetes?

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2. Fragmentation
3. Sexual+
4. Asexual
5. By means of spores

62. Representatives of twisted (spiral) forms of bacteria:

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3. Syphilis agent+
4. Chlamydiae
5. Sarcina

63. A method for rickettsia cultivation:

1. Basic nutrient media
2. Complex nutrient media
3. Special medium
4. Sabouraud medium
5. Cell culture+

64. Motile forms of microorganisms:

1. Staphylococci
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3. Rickettsiae
4. Spirochetes+
5. Bacilli

65. A method for detection of spirochetes motility:

1. Romanovsky-Giemsa stain
2. Dark field microscopy+
3. Luminescent microscopy
4. Electron microscopy
5. Gram stain

66. Non-fungal disease:

1. Actinomycosis+
2. Aspergillosis
3. Favus
4. Microsporosis
5. Candidiasis

67. The mechanism of group translocation is used in:

1. Respiration
2. Reproduction
3. Trans-membrane transportation+
4. Growth
5. Sporulation

68. The sources of carbon for autotrophs:

1. Proteins
2. Carbohydrates
3. Carbon dioxide+
4. Lipids
5. Vitamins

69. Bacteria that need growth factors for propagation:

1. Organotrophs
2. Heterotrophs
3. Chemotrophs
4. Auxotrophs+
5. Lithotrophs

70. Nutrient media, providing the isolation of bacteria in pure culture:

1. Simple
2. Complex
3. Selective+
4. Synthethic
5. Differential

71. Method for simple nutrient media sterilization:

1. Pasteurisation
2. Tindalisation
3. Boiling
4. Autoclaving+
5. Irradiation

72. Division of bacteria based on the source of carbon:

1. Heterotrophs+
2. Phototrophs
3. Organotrophs
4. Chemotrophs
5. Lithotrophs

73. Anabolism implies:

1. ATP synthesis
2. Degradation of biopolymers
3. Energy liberation
4. Peptide chain elongation+
5. Hydrolysis of macromolecules

74. Asepsis means:

1. Eradication of pathogenic microorganisms in the environment by chemical compounds
2. Elimination of the invaded microbes from the body
3. Termination of bacterial and fungal growth in wounds with chemical substances
4. Treatment of sepsis
5. Complex of measures, preventing microbial contamination of any object, including instruments, dressing material, linen, wound surfaces, etc.+

75. Symport means:

1. Nutrition process without energy consumption
2. Mechanism of nutrition based on group translocation
3. Simultaneous transport of two substances in opposite directions
4. Movement of bacterial cells in the same direction
5. Parallel transportation of two substances in the same direction+

76. One of the most efficient and well-tolerated antiseptics:

1. Chlorhexidine+
2. Formaldehyde
3. Phenol
4. Boric acid
5. Household bleach

77. Catabolism provides for microorganisms:

1. Protein synthesis
2. Any macromolecule synthesis
3. ATP accumulation+
4. Supply with growth factors
5. Nucleoid replication

78. The sources of carbon for heterotrophs:

1. Proteins
2. Carbohydrates
3. Nucleic acids
4. Lipids
5. All above mentioned+

79. Division of bacteria according to energy source:

1. Heterotrophs
2. Autotrophs
3. Auxotrophs
4. Chemotrophs+
5. Lithotrophs

80. Nutrient medium for examination of biochemical properties of bacteria:

1. MPA
2. MPB
3. Hiss media+
4. Ascite agar
5. Gelatine

81. Kind of trans-membrane transport without energy consumption:

1. Facilitated diffusion+
2. Proton-motive force
3. Symport
4. Antiport
5. Group translocation

82. Disinfection means:

1. Liquidation of vegetative microbial forms and their spores in various materials with heating;
2. Number of measures for eradication of microbial species from objects in external environment by chemical compounds or physical methods+
3. Complete elimination of all microbial forms
4. Killing of bacteria directly in the wounds by chemical substances
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83. Method of choice for sterilization of glass utensils:

1. Autoclaving
2. Pasteurization
3. Tindalization
4. Filtration
5. Heating with hot air in Pasteur chamber+

84. Antiport means:

1. Anti-microbial intervention dampening trans-membrane transportation in bacteria
2. Nutrition of bacteria without energy consumption
3. Simultaneous transportation of two substances in opposite directions+
4. Simultaneous transport of two substances in the same direction
5. Inhibition of bacterial motility

85. Basic nutrient medium:

1. Endo medium
2. McConkey medium
3. MPA+
4. Hiss medium
5. Soton's medium

86. Method of non-complete sterilization:

1. Autoclaving under pressure;
2. Gamma-irradiation;
3. Heating in Pasteur oven
4. Boiling+
5. Tindalization

87. Microbial pathogens passing across membranes under sterilization by filtration:

1. Viruses+
2. Bacteria
3. Bacilli
4. Protozoans
5. Fungi

88. Bacteria cultured at low oxygen concentration:

1. Aerotolerant bacteria
2. Obligate anaerobes
3. Facultative anaerobes
4. Obligate aerobes
5. Microaerophils+

89. Obligate aerobes:

1. Staphylococci
2. Spirillas
3. Pseudomonas aeruginosa+
4. Rickettsiae
5. Enterobacteria

90. Obligate anaerobes:

1. Staphylococci
2. Streptococci
3. Clostridia+
4. Rickettsiae
5. Mycoplasmas

91. Medium for strict anaerobes cultivation:

1. Ferric sulfite agar+
2. MPA
3. MPB
4. Endo medium
5. Hiss medium

92. Essential trait of S-forms of colonies:

1. Serratious edges
2. Smooth surface+
3. Flat surface
4. Rough surface
5. Presence of flagella

93. Bacteria that utilize oxygen as single final electron acceptor:

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2. Obligate anaerobes
3. Facultative anaerobes
4. Obligate aerobes+
5. Microaerophils

94. Bacteria reproduced by means of spores:

1. Gram-negative bacteria
2. Clostridia
3. Spirochaetes
4. Chlamydia
5. Actinomycetes+

95. Nitrate is final acceptor of electrons and protons for:

1. Capnophils
2. Obligate anaerobes+
3. Facultative anaerobes
4. Obligate aerobes
5. Microaerophils

96. Process, where the bacteria produce a single product of fermentation:

1. Glycolysis
2. Substrate phosphorylation
3. Entner-Doudoroff pathway
4. Homofermentative+
5. Heterofermentative

97. Microaerophilic bacteria:

1. Staphylococcci
2. Escherichia coli
3. Clostridia
4. Helicobacter pylori+
5. Pseudomonads

98. Terminal enzymes in respiratory chain of strict aerobes:

1. Ubiquinones
2. Catalases
3. Dehydrogenases
4. Reductases
5. Cytochromes+

99. Obligate anaerobes:

1. Staphylococci
2. Streptococci
3. Bacteroids+
4. Pseudomonads
5. Bordetellae

100. Obligate aerobic bacterium:

1. Mycobacterium tuberculosis+
2. Clostridium tetani
3. Treponema pallidum
4. Rickettsia provazekii
5. Bacteroides fragilis

101. Method for anaerobes cultivation:

1. In aerobic jar
2. In Pasteur chamber
3. In deep agar culture of Wilson-Blair medium+
4. In Petri dish with MPA
5. In test tube with MPB

102. The process where organic substances are the donors and acceptors of electrons and protons:

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5. Catabolism

103. Kind of bacterial reproduction:

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3. Conjugation
4. Mitosis
5. Sexual reproduction

104. Essential trait of R-forms of colonies:

1. Straight edges
2. Smooth surface
3. Flat surface
4. Resistance to antibiotics
5. Rough surface+

105. The most beneficial pathway for energy gain in bacteria:

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2. Pentose monophosphate pathway
3. Entner-Doudoroff pathway
4. Oxidative phosphorylation+
5. Substrate phosphorylation

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1. Homofermentative
2. Heterofermentative+
3. Glycolysis
4. Substrate phosphorylation
5. Oxidative phosphorylation

107. Facultative anaerobes are:

1. Helicobacter
2. Pseudomonas
3. Escherichia+
4. Clostridium
5. Brucella

108. The enzyme absent in obligate anaerobes:

1. DNA-polymerase
2. Superoxide dismutase+
3. Permease
4. Hyaluronidase
5. Nitrate reductase

109. Substances, toxic for anaerobic bacteria:

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3. Hydrogen
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5. Propionic acid

110. Enzyme properties:

1. Polysaccharides
2. Low molecular weight
3. Thermostability
4. High binding to transition state of substrate+
5. High binding to product

111. Enzymes of protein synthesis:

1. Exo-enzymes
2. Connected with ribosomes+
3. Localized in cell membrane
4. Localized in mesosomes
5. Attached to nucleoid

112. Oxyreductases:

1. Accelerate processes of synthesis
2. Break bonds between carbon atoms in molecule
3. Move residues from one molecule to another
4. Attach water molecule to substrate
5. Accelerate reactions of electron loss or acquisition+

113. Lyases:

1. Break bonds in molecules with hydrolytic mechanism
2. Break bonds in molecules with non-hydrolytic mechanism+
3. Transfer atoms between groups in molecule
4. Accelerate redox processes
5. Join one molecule to another

114. Hydrolases:

1. Accelerate synthesis of complex substances from simple ones
2. Break bonds in molecules with non-hydrolytic mechanism
3. Break bonds in molecules with water molecule loss
4. Break bonds in molecules with water molecule attachment+
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115. Enzyme of aggression:

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3. Hyaluronidase+
4. Reverse transcriptase
5. DNA-ligase

116. Medium for testing of bacterial carbohydrate fermentation:

1. MPA
2. MPB
3. Hiss medium+
4. Gelatin
5. Blood agar

117. Test substance for H_2S determination after proteolysis:

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2. Oxalate – red colour
3. Bromide cresol blue – purple
4. Lachmus – blue colour
5. Silver nitrate – white

118. Pathogenic representatives of bowel microflora:

1. Bifidobacteria
2. Veillonella
3. Helicobacter pylori
4. E. coli
5. Bacteroides fragilis+

119. Drugs for dysbacteriosis treatment:

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3. Antiseptics
4. Probiotics+
5. Absorbents

120. Normal microflora dominating in vagina of adult women:

1. Lactobacilli+
2. Streptococci
3. Bacteroids
4. Gardnerellas
5. Staphylococci

121. Enzyme properties:

1. Inorganic catalysts
2. Stabilize transition state of substrate+
3. Low molecular weight
4. Thermostability
5. Increase energy of substrate activation

122. Enzymes of energy metabolism:

1. Exo-enzymes
2. Localized in ribosomes
3. Localized in cell membrane+
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5. Accelerate microbial spread in affected host

123. Transferases:

1. Accelerate synthesis of complex substances
2. Disrupt bonds between nitrogen and carbon atoms by non-hydrolytic manner
3. Provide movement of chemical groups from one molecule to another+
4. Accelerate redox reactions
5. Catalyze transfer of chemical groups within the same molecule

124. Lygases:

1. Catalyze synthesis of complex molecules from more simple ones+
2. Transform molecules into their isomers
3. Transpose atoms between molecules
4. Accelerate electron and proton transfer
5. Catalyze the decay of complex molecules

125. Isomerases:

1. Stimulate joining of various molecules
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3. Transfer chemical groups between various molecules
4. Convert polymers into monomers
5. Provide substrate oxygenation

126. Enzyme of aggression and invasion:

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2. Nitrate reductase
3. DNA-polymerase
4. Cytochrome
5. Elongase

127. Medium for proteolytic enzymes detection:

1. MPA
2. Gelatin+
3. McConkey medium
4. Hiss medium
5. Blood agar

128. Indicator for indole determination after proteolysis:

1. Lead acetate – black colour
2. Fuchsin – red colour
3. Oxalate – pink colour+
4. Bismuth sulfite – black colour
5. Lachmus – blue colour

129. Sterile body compartments:

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3. Stomach
4. Intestine
5. Vagina

130. Drug for dysbacteriosis treatment:

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2. Co-trimoxasol
3. Charcoal
4. Colibacterin+
5. Alcohol

131. Microflora, dominating in oral cavity:

1. Neisseria
2. Bacteroids
3. Lactobacilli
4. Streptococci+
5. Spirochetes

132. Commensalism means:

1. Bacteria don't influence one another
2. One of symbionts exploits another one without harmful effect+
3. Both beneficial co-existence
4. Two species stimulate one another with additional activating effect
5. Microbial species exploits another one with harmful effect

133. Neutralism means:

1. Bacteria don't influence one another+
2. One of symbionts exploits another one without harmful effect
3. Both beneficial co-existence
4. Two species stimulate one another with additional activating effect
5. Microbial species exploits another one with harmful effect

134. Model sanitary microorganisms are:

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2. Saprophytic bacteria
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4. Hospital ecovariants of bacteria
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135. Total microbial count for air:

1. Total microbial quantity freely sedimented from air upon 1 $м^2$ of ground area
2. Total microbial quantity in 1 $м^3$ of air+
3. Total microbial quantity in 1 liter of air
4. Total microbial quantity in 1 $см^3$ of air
5. Total microbial quantity in certain room

136. Model sanitary microorganisms for air quality testing:

1. Aerococci
2. Escherichia coli
3. Spores of clostridia present in air
4. Staphylococcus aureus+
5. Mycobacterium tuberculosis

137. Total microbial count for water:

1. Quantity of mesophilic chemoorganotrophic bacteria in 1 ml of water+
2. Quantity of mesophilic chemoorganotrophic bacteria in 100 ml of water
3. Quantity of mesophilic chemoorganotrophic bacteria in 1 liter of water
4. Quantity of thermophilic bacteria in 1 ml of water
5. Total quantity of thermotolerant bacteria in 1 liter of water

138. Method for testing of air sanitary quality:

1. Titration method
2. Membrane filtration method
3. Serial dilution method
4. Inoculation into Kessler medium
5. Aspiration method+

139. Model sanitary microorganisms for hand wash testing:

1. Coliform bacteria
2. Spores of clostridia
3. Intestinal microflora
4. Oral microflora
5. E. coli+

140. Thermotolerant coliform bacteria are cultured:

1. at 44^0+
2. at 50^0
3. at 37^0
4. at 20^0
5. at 55^0

141. Overt antagonism means:

1. Bacteria produce antibiotic substances in spite of rival presence in the medium+
2. Bacteria synthesize antibiotics only when another microorganism appear in closest proximity
3. Microorganisms produce antibiotics being cultured in starvation
4. Microorganisms produce antibiotics when grown on selective media
5. Bacteria secrete antibiotics inconstantly, sometimes

142. These elements comprise the common ecosystem except

1. Microbial communities
2. Biotope
3. Relationships established among symbiotic microbial populations
4. Competition for nutrients amongst various bacterial species inhabiting the same locality
5. Microbial communities inhabiting non-related biotopes+

143. Mutualism means:

1. Bacteria don't influence one another
2. One of symbionts exploits another one without harmful effect
3. Both beneficial co-existence+
4. Two species stimulate one another with additional activating effect
5. Microbial species exploits another one with harmful effect

144. Synergism means:

1. Bacteria don't influence one another
2. One of symbionts exploits another one without harmful effect
3. Both beneficial co-existence
4. Two species stimulate one another with additional activating effect+
5. Microbial species exploits another one with harmful effect

145. Model sanitary microorganisms:

1. Representatives of temporary (or casual) microflora of human body
2. Live longer than pathogenic bacteria
3. Have special reservoir for propagation outside the body
4. Can be easily monitored by standard microbiological tests+
5. Capable of reproduction in the environment

146. Model sanitary bacteria for water:

1. Pseudomonads
2. Slime moulds
3. Salmonellae
4. Clostridia
5. Coliform bacteria+

147. Model sanitary microorganisms for air:

1. Pathogenic meningococci
2. Non-pathogenic tetracocci
3. Non-pathogenic micrococci
4. Non-hemolytic staphylococci
5. Hemolytic streptococci+

148. This feature is essential for hospital (or nosocomial) strains:

1. Multiple resistance to antibiotics+
2. Survive as planktonic forms
3. Slow production of virulence factors
4. Spore-forming bacteria
5. Circulation in the environment

149. Method for water microbial testing:

1. Blood agar plating
2. Membrane filtration+
3. Aspiration test
4. Sedimentation test
5. Deep agar cultivation

150. Properties of *E. coli*:

1. Gram-positive rods
2. Gram-negative rods+
3. Oxydase-positive
4. Spore-forming bacteria
5. Lactose-negative bacteria

151. End products of lactose fermentation by coliform bacteria:

1. Gases and acids+
2. Gases only
3. Only acids
4. Neither acids no gases
5. Alcohols and gases

152. Forced antagonism means:

1. Bacteria produce antibiotics in spite of rival presence in the medium
2. Bacteria synthesize antibiotics only in presence of another microorganism+
3. Microorganisms produce antibiotics being cultured in starvation
4. Microorganisms produce antibiotics when grown on selective media
5. Bacteria occasionally secrete antibiotics

153. Bacteria transmitted predominantly by air-droplet route:

1. Leptospirae
2. Salmonellae
3. Treponemas
4. Mycobacteria+
5. Shigellae

154. Antibiotics, affecting cytoplasmic membrane:

1. Beta-lactams
2. Aminoglycosides
3. Macrolides
4. Polyenes+
5. Tetracyclines

155. Antibiotics, blocking bacterial protein synthesis:

1. Beta-lactams
2. Rifampin
3. Fluoroquinolones
4. Sulfonamides
5. Aminoglycosides+

156. Antibiotics, inhibiting nucleic acid replication:

1. Fluoroquinolones+
2. Penicillins
3. Glycopeptides
4. Aminoglycosides
5. Cephalosporins

157. Genetic resistance to antibiotics emerges after:

1. Plasmid acquisition after conjugation+
2. Inhibition of antibiotic influx
3. Acceleration of synthesis of molecular targets for antibiotic
4. Activation of antibiotic efflux
5. Beta-lactamase synthesis

158. Bactericidal drug:

1. Doxycycline
2. Erythromycin in low doses
3. Sulfamethoxazole
4. Chloramphenicol
5. None from above listed+

159. Antibiotics, derived from bacteria:

1. Penicillins
2. Cephalosporins
3. Polymyxins+
4. Fluoroquinolones
5. Tetracyclines

160. Methods for MIC determination:

1. Disk diffusion method
2. Immune diffusion method
3. Serial dilution method+
4. Neutralization method
5. Biological method

161. All of listed antibiotics develop bactericidal effect except:

1. Penicillins
2. Cephalosporins
3. Fluoroquinolones
4. Rifampin
5. Tetracyclines+

162. Frequent allergic side effects are characteristics of:

1. Rifampin
2. Sulfonamides
3. Beta-lactams+
4. Azalides
5. Aminoglycosides

163. Enzyme, inactivating cephalosporins:

1. Transacetylase
2. Beta-lactamase+
3. Dihydrofolate reductase
4. Peptidyl transferase
5. None of listed above

164. Levels of minimal bactericidal concentration in comparison with minimal inhibitory concentration are:

1. Less than
2. Equal or less
3. Equal
4. Equal or more+
5. More

165. Antibiotics, inhibiting cell wall synthesis:

1. Polyens
2. Beta-lactams+
3. Macrolides
4. Tetracyclines
5. Aminoglycosides

166. Antibiotics, blocking protein synthesis:

1. Cephalosporins
2. Rifampin
3. Azalides+
4. Fluoroquinolones
5. Sulfonamides

167. Antibiotics, inhibiting nucleic acid metabolism:

1. Rifampin+
2. Penicillins
3. Azalides
4. Aminoglycosides
5. Lincomycin

168. Antibiotics, derived from actinomycetes:

1. Penicillins
2. Cephalosporins
3. Fluoroquinolones
4. Chloramphenicol+
5. Sulfonamides

169. Antibiotics, produced by plants:

1. Penicillins
2. Phytoncides+
3. Azalides
4. Vancomycin
5. Amphotericin A and B

170. First stage of beta-lactam antibiotics action:

1. Hydrolysis of cell wall
2. Phagocytosis activation
3. Cell autolysis
4. Transpeptidase inhibition+
5. Activation of trans-membrane channels

171. Side effects of antibiotic therapy:

1. Allergic reactions
2. Direct toxic effects
3. Antibiotic resistance development
4. Endotoxic shock emergence
5. All above listed+

172. These drugs are less allergenic:

1. Penicillins
2. Macrolides+
3. Chloramphenicol
4. Cephalosporins
5. Tetracyclines

173. Antifungal antibiotics:

1. Beta-lactams
2. Rifampin
3. Polyenes+
4. Macrolides
5. Aztreonam

174. Antibiotics, occasionally causing serum sickness:

1. Erythromycin
2. Aminoglycosides
3. Penicillins+
4. Azalides
5. Sulfonamides

175. Diffusion antibiotic susceptibility test with MIC determination:

1. Disc diffusion test
2. E-test+
3. Immune diffusion test
4. Agar serial dilution test
5. Broth serial dilution test

176. The base, essential only for RNA:

1. Adenine
2. Thymine
3. Guanine
4. Cytosine
5. Uracil+

177. Messenger RNA synthesis results from:

1. Transcription+
2. Translation
3. Transduction
4. Transformation
5. Translocation

178. Genetic sequence in operon that interacts with RNA polymerase for transcription initiation:

1. Regulatory gene
2. Operator
3. Promoter+
4. Enhancer
5. Structural gene

179. What statement isn't true:

1. Genes, essential for bacterial metabolism, are localized mainly in nucleoid
2. Autonomous bacterial replicons able to integrate to nucleoid are named episomes
3. Bacterial genome is diploid+
4. Bacterial genetic information is stored in DNA
5. Bacterial DNA replication starts from *ori* locus

180. Genetic sequence, ensuring bacterial capacity to conjugation:

1. *Ori*-locus
2. Prophage sequence
3. *Lac*-operon
4. *Tra*-operon+
5. Competence factor

181. The plasmid encoding hemolysin synthesis:

1. R-plasmid
2. Ent-plasmid
3. Hly-plasmid+
4. Col-plasmid
5. F-factor

182. Variant of recombination:

1. Transformation+
2. Dissociation
3. Reparation
4. Modification
5. Duplication

183. Hfr-cell appears due to:

1. Missense mutation
2. Lysogenic conversion
3. Tra-operon activation
4. Transposon integration
5. F-factor integration into nucleoid+

184. Possible transduction type, where accepted genetic material is not included into nucleoid:

1. General
2. Specific
3. Illegitimate
4. Abortive+
5. None of above listed

185. The stage needed only for RNA viruses detection by PCR:

1. DNA melting
2. Primer annealing
3. DNA polymerization
4. Amplification cycle repeat
5. Reverse transcription+

186. Northern blotting is used for:

1. DNA identification
2. RNA identification+
3. Protein identification
4. DNA sequencing
5. Peptide synthesis

187. Complementary base in RNA for uracil:

1. Adenine+
2. Thymine
3. Guanine
4. Methyl-guanine
5. Cytosine

188. The largest replicon in bacterial cell:

1. Plasmid
2. Episome
3. Transposon
4. Insertion sequence
5. Nucleoid+

189. Genetic sequence in operon that accelerates transcription via the interaction with specific activator proteins:

1. Regulatory gene
2. Operator
3. Structural gene
4. Promoter
5. Enhancer+

190. The structure that not pertains to plasmids:

1. F-factor
2. R-factor
3. Factor of bacteriocinogenesis
4. Competence factor+
5. Col-factor

191. Mobile genetic element:

1. Regulon
2. Replicon
3. Operon
4. Bacteriocin
5. IS-sequence+

192. Genetic event that elicit frame shift mutation:

1. Nucleotide deletion+
2. Nucleotide replacement
3. Triplet insertion
4. Codon deletion
5. Codon translocation

193. Non-genetic variation:

1. Transformation
2. Transduction
3. Conjugation
4. Reparation
5. Modification+

194. Bacterial transformation is performed after:

1. Mutagen action
2. Bacteriophage entry
3. Plasmid acceptance
4. Donor's DNA uptake+
5. None of listed above

195. Enzymes, governing recombination process:

1. Rec-proteins+
2. G-proteins
3. Transposases
4. Proteinkinases
5. Transferases

196. Hybridization technique is based on:

1. Gene transfer by vectors
2. Genetic recombination
3. DNA or RNA interaction with complementary probe+
4. DNA amplification
5. Genetic transposition

197. Most rapid method of genetic sequencing:

1. Sanger's method
2. Maxam and Gilbert sequencing
3. "Shotgun" technique+
4. Chromosome walking
5. Pyrosequencing

Section 2.
Medical Immunology & Infection

1. Central organ of immune system:

    1. Bone marrow+
    2. MALT
    3. Lymph node
    4. Spleen
    5. Blood

2. Cell subsets of immune system bearing Ag-specific receptors:

    1. Mononuclear phagocytes system
    2. Granulocytes system
    3. Natural killer cells
    4. T and B cells+
    5. Platelets system

3. Natural active immunity is developed via:

    1. Breast feeding
    2. After vaccination
    3. After infectious disease+
    4. From mother to fetus
    5. After immunoglobulin administration

4. Artificial passive immunity is obtained:

    1. After infectious disease
    2. After vaccination
    3. Due to immunoglobulin administration+
    4. After toxoids injection
    5. From mother to fetus

5. Respiratory burst means:

1. Biological oxidation in bacteria
2. Mitochondrial respiration in lymphocytes
3. Activation of reactive oxygen species in phagocytes+
4. Oxidative phosphorylation in phagocytes
5. Oxygenation of lymphoid tissue

6. The organ of antigen-independent differentiation of T-lymphocytes:

1. Lymph node
2. Thymus+
3. Spleen
4. Liver
5. Tonsils

7. Pro-inflammatory cytokine:

1. IL-10
2. IL-12+
3. IL-3
4. IL-7
5. IL-4

8. Phagocytic cells:

1. Monocytes+
2. T-cells
3. B-lymphocytes
4. Plasma cells
5. Natural killers

9. T-helper marker:

1. CD1
2. CD40
3. CD4+
4. CD8
5. CD5

10. Membrane integrins:

1. CD16
2. CD11/18+
3. CD40
4. CD19-22
5. CD95

11. Cells in thymus promoting auto-reactive T lymphocytes apoptosis:

1. Thymocytes
2. Nurse cells+
3. Fibroblasts
4. Neutrophils
5. B cells

12. CD-marker of B-cells:

1. CD19+
2. CD8
3. CD4
4. CD2
5. CD1

13. Kind of anti-infectious immunity:

1. Anti-cancer
2. Anti-drug immunity
3. Anti-parasitic+
4. Transplantation immunity
5. Reproductive

14. CD-marker of cytotoxic lymphocytes:

1. CD1
2. CD2
3. CD4
4. CD5
5. CD8+

15. Kind of immunity formed after toxoid injections:

1. Artificial passive
2. Artificial active+
3. Natural active
4. Natural passive
5. Non-sterile

16. Antibodies, enhancing phagocytosis:

1. Agglutinins
2. Precipitins
3. Hemolysins
4. Opsonins+
5. Anti-toxins

17. Macrophages perform:

1. Bacterial engulfment
2. Cytokines secretion
3. Antigen presentation
4. Microbial degradation
5. All above-mentioned is correct+

18. Newborn child obtains from mother:

1. IgM
2. IgA+
3. B-cells
4. T-helper cells
5. Phagocytes

19. IL-1 causes:

1. Direct viral destruction
2. B-cells activation
3. Anti-inflammatory effects
4. Antibody production
5. Fever+

20. Natural passive immunity is obtained after:

1. From mother to fetus through placenta+
2. After blood transfusion
3. Infectious disease
4. Vaccination
5. Immunoglobulin treatment

21. Chemokine for neutrophils:

1. IL-2
2. IL-3
3. IL-4
4. IL-7
5. IL-8+

22. Anti-bacterial substances that exert microbial degradation within phagocytes due to free radicals formation

1. Catepsins
2. Defensins
3. Acid hydrolases
4. Reactive oxygen species+
5. Opsonins

23. Properties of complete antigens:

1. Doesn't need carrier+
2. Doesn't need their own presentation for T cells
3. Presumably of lipid origin
4. Non-charged linear molecules
5. Low molecular weight polysaccharides

24. Thymus-dependent antigens can be presented for T helpers by following cells:

1. Neutrophils
2. Eosinophils
3. Epithelial cells
4. NK-cells
5. B-lymphocytes+

25. Specific bacterial antigen:

1. Hemagglutinin
2. Vi-antigen+
3. Rh-antigen
4. HLA-B27 antigen
5. β-$_2$ microglobulin

26. Cells bearing major histocompatibility complex class II antigens:

1. Natural killer cells
2. Dendritic cells+
3. Enterocytes
4. Epithelial cells
5. Erythrocytes

27. Specific structure of an antigen:

1. Hinge region
2. Fc fragment
3. Paratope
4. Epitope+
5. Biotope

28. Agglutinating serum is used for:

1. Bacterial identification+
2. Virus identification
3. Antibody determination
4. TCR specifity assessment
5. Coombs' test

29. Erythrocyte antigenic diagnosticum is used for:

1. Extended agglutination reaction
2. Indirect hemagglutination test+
3. Direct hemagglutination test
4. Hemolysis reaction
5. Tentative slide agglutination reaction

30. Non-infectious antigens are:

1. O-Ag
2. H-Ag
3. Vi-Ag
4. K-Ag
5. MHC Ags+

31. Superantigens induce:

1. Up to 2% of common T-cells activation
2. Up to 20% of common T-cells activation+
3. B-cells activation
4. Classic pathway complement activation
5. IL-4 and IL-10 secretion

32. CD8+ cells recognize antigen peptide in complex with:

1. TAP-Ag
2. IL-2 receptor
3. HLA I class Ag+
4. HLA II class Ag
5. Without any complexing

33. Antigenic peptide is processed for next presentation in complex with HLA I class:

1. In phagosome
2. In ribosome
3. Within inflammasome
4. In proteasome+
5. Within membrane vesicle

34. Hapten is characterized by:

1. Strong immunogenicity
2. Complete antigen
3. High molecular weight
4. Needs adjuvants
5. Needs carrier+

35. Which of listed substances pertain to complete antigens:

1. Lipids
2. Proteins+
3. Glucose
4. Vitamins
5. Beta-lactam antibiotics

36. The structure, complementary to antigenic determinant:

1. Biotope
2. Paratope+
3. Episome
4. Epitope
5. Hinge region

37. Thymus-independent antigens directly induce immune response of:

1. Neutrophils
2. Natural killer cells
3. T-cells
4. B-lymphocytes+
5. Mast cells

38. Antigens that pertain to MHC:

1. AB0
2. Rh
3. Superantigens
4. O-antigen
5. HLA+

39. All of listed cells bear MHC class I antigens except:

1. Erythrocytes+
2. T-cells
3. Dendritic cells
4. Enterocytes
5. Keratinocytes

40. Immunogenicity means:

1. Ability to specific binding of Ag to antibodies
2. To induce specific response of T and B cells+
3. To trigger phagocytosis
4. To activate complement system
5. To induce tolerance

41. Coombs` reaction estimates:

1. Incomplete antibodies+
2. Incomplete antigens
3. Incomplete phagocytosis
4. T-cell receptors
5. Rhesus antigens

42. Bacterial specific agglutionation is possible due to:

1. Termination of bacterial movement
2. Low salt concentration
3. Lowering of pH
4. Specifity of antibodies
5. Multivalent specific interaction of bacteria with complete antibodies+

43. Erythrocyte antigenic diagnosticum means:

1. Antigens of erythrocytes
2. Erythrocytes attached to polymeric microbeads
3. Ist blood group erythrocytes
4. Erythrocytes linked with specific antigens+
5. Erythrocytes with attached specific antibodies

44. Antibodies against human immunoglobulins are used in:

1. Slide agglutination test
2. Extended test tube aglutination
3. Blood groups determination
4. Widal's reaction
5. Coombs'reaction+

45. Antigen-binding site of antibody:

1. L-chain
2. Paratope+
3. Epitope
4. Hinge region
5. Fc-fragment

46. Part of antibody responsible for Ab-cell interaction:

1. Light chain
2. Heavy chain
3. J-chain
4. Fab fragment
5. Fc fragment+

47. Binding strength of whole antibody molecule:

1. Capacity
2. Affinity
3. Avidity+
4. Specifity
5. Activity

48. Serum IgG concentration:

1. 8-12 g/l+
2. 0,8-1,5 g/l
3. 0-100 ME
4. 0,01-0,04 g/l
5. 1-2 g/l

49. IgM is characterized as:

1. Monomer
2. Dimer
3. Trimer
4. Pentamer+
5. Secretory molecule

50. Antibodies shown to exert allergy pertain to:

1. IgM
2. IgG
3. IgA
4. IgD
5. IgE+

51. Monoclonal antibodies are obtained with:

1. Rabbits immunization
2. Chemical synthesis
3. Human immunization
4. Hybridoma technology+
5. Two antibody-secreting cell lines fusion

52. Toxigenicity of diphtheria bacilli culture is determined by:

1. Agglutination reaction
2. Indirect hemagglutination assay
3. Neutralization reaction+
4. Radial immune diffusion
5. Immune electrophoresis

53. Immunoglobulins capable to pass through the placental barrier:

1. IgG+
2. IgA
3. IgM
4. IgE
5. IgD

54. Reagent for neutralization reaction:

1. Diagnosticum
2. Toxin or toxoid preparations+
3. Antimicrobial serum
4. Erythrocyte diagnosticum
5. Agglutinating serum

55. Method for IgE concentration assessment:

1. Agglutination test
2. Ascoli's test
3. Mancini test
4. ELISA test+
5. Complement fixation test

56. Antigen-binding site of antibody is formed by:

1. Domains of L-chain
2. Domains of H-chain
3. Constant domains
4. Variable domains+
5. Hinge region

57. Part of antibody responsible for complement activation:

1. Light chain
2. Heavy chain
3. Fc fragment+
4. Fab fragment
5. Paratope

58. Binding capacity of antibody active site is named:

1. Affinity+
2. Avidity
3. Reactivity
4. Specifity
5. Immunogenicity

59. Serum IgM concentration:

1. 8-12 g/l
2. 0-100 ME
3. 0,01-0,04 g/l
4. 2-4 g/l
5. 0,8-1,5 g/l+

60. The main advantage of immune electrophoresis:

1. Rapid test
2. High sensitivity
3. One-step solid phase test
4. Able to identify particular antigens in complex antigenic mixture+
5. Easy performance and low cost

61. Immunoglobulin molecule with secretory component:

1. IgM
2. IgG
3. IgD
4. IgA+
5. IgE

62. Immunoglobulin G concentration is determined by:

1. Neutralization reaction
2. Precipitation reaction
3. Mancini radial immune diffusion+
4. Ouchterloni double immune diffusion
5. Indirect hemagglutination reaction

63. Double immune diffusion can be used for:

1. Antibody or antigen determination+
2. Microbial identification
3. Blood group determination
4. Identification of cellular sub-populations
5. Incomplete antibodies determination

64. Opsonization by antibodies means:

1. Complement activation
2. Abzyme action
3. Toxin blockade
4. Immune phagocytosis activation+
5. Acceleration of antigen processing

65. Reagent for precipitation reaction:

1. Microbial diagnosticum
2. Soluble antigen+
3. Erythrocyte diagnosticum
4. Serum containing active complement
5. Viral diagnosticum

66. Monoclonal antibodies used for treatment of human diseases are:

1. Of mouse origin "humanized" by genetic engineering+
2. Of mouse origin
3. Of human origin
4. Of rabbit origin
5. Obtained from myeloma cell lines

67. Component of complement system, starting alternative pathway activation:

1. C1
2. C2
3. C3+
4. C4
5. C5

68. Classical pathway convertase:

1. C3b
2. C3bBb
3. C1qrs
4. C4bC2a+
5. C5b-C9

69. Wassermann reaction means:

1. Complement fixation test for serologic diagnosis of syphilis+
2. Complement fixation test for influenza diagnosis
3. Direct fluorescent-antibody testing against *T. pallidum* in syphilis
4. Tube agglutination test for antibodies in enteric typhoid fever
5. ELISA IgM antibody test for diagnosis of congenital syphilis

70. Hemolysis reaction is used for:

1. Bacteriolysis test
2. Complement activity determination+
3. ELISA
4. Coombs' reaction
5. Western blotting

71. Reagent for indirect immune fluorescence test:

1. Anti-globulin labeled with enzyme
2. Anti-globulin labeled with isotope
3. Anti-globulin labeled with ^{125}I
4. Anti-globulin labeled with horseradish peroxidase
5. Anti-globulin labeled with FITC+

72. Potent anaphylatoxin:

1. C5a+
2. MAC
3. C2a
4. C4b
5. C1qrs

73. Reagent for radioimmunoassay:

1. Incomplete antibody
2. Enzyme
3. Substrate
4. Fluorescent dye
5. Isotope+

74. Anti-globulin serum is obtained by:

1. Immunization of rabbits with erythrocytes
2. Immunization of rabbits with human antibodies+
3. Immunization of rabbits with globular synthetic microbeads
4. Immunization of mice with hapten
5. Immunization of goats with mouse albumin

75. First step for immunoblotting:

1. Immune electrophoresis
2. Radial immune diffusion
3. Indirect enzyme-linked immune assay
4. Polyacrylamide electrophoresis+
5. Ascoli's test

76. Reagent for enzyme immunoassay:

1. Substrate+
2. Diagnosticum
3. Complement
4. Anti-globulin labeled with FITC
5. Anti-globulin labeled with iodine

77. Lectin pathway is activated by:

1. Immune complex
2. Bacterial flagellin
3. Mannose-binding protein+
4. C3b component
5. Fc fragment

78. Classic pathway of complement activation is initiated by:

1. Antibodies
2. Antigens
3. Immune complex formation+
4. Toxins
5. LPS

79. Immunological test allowing determination of any cell sub-population by identification of its membrane CD molecules:

1. Radioimmune assay
2. ELISA test
3. Indirect immune fluorescence test with monoclonal antibodies+
4. Indirect hemagglutination test
5. Complement fixation test

80. In classic pathway C1q subunit is attached to:

1. CH3 Ig domain
2. CH2 Ig domain+
3. CH1 Ig domain
4. VL domain
5. CL domain

81. Complement can take part in:

1. Cell lysis
2. Opsonization
3. Chemotaxis
4. Allergy development
5. All mentioned above+

82. C5-convertase in alternative pathway:

1. C3b
2. C3bBb
3. C4bC2a
4. P[C3bBbC3b]+
5. Decay accelerating factor (DAF)

83. Cell lysis due to complement action is performed by:

1. Membrane attack complex+
2. Anaphylatoxin attack
3. Immune complex
4. C3 convertase
5. C5 convertase

84. Indicator system for complement fixation test:

1. Complement system
2. Sheep red blood cells with hemolytic serum+
3. Sheep red blood cells
4. Hemolytic serum
5. Fluorescent label

85. Method for simultaneous determination of different antigenic or antibody fractions:

1. Immunofluorescent test
2. Immunoblotting test+
3. Radioimmune assay
4. Enzyme immunoassay
5. Radioallergosorbent test

86. Hemolytic serum is obtained by:

1. Immunization of rabbits with microbial cells
2. Immunization of mice with bacteria
3. Immunization of rabbits with human erythrocytes
4. Immunization of mice with complement
5. Immunization of rabbits with sheep erythrocytes+

87. Protein blotting is named as:

1. Eastern blotting
2. Southern blotting
3. Northern blotting
4. Western blotting+
5. None of listed above

88. Tests with labeled antibodies or antigens predominate in current laboratory immunology owing to:

1. Easy use
2. Low cost
3. Automatic computer-assisted detection
4. Superior tests efficacy (highest sensitivity, specificity, reproducibility)+
5. Capabilities of mass screening

89. T-independent immune response results in production of:

1. IgM class antibodies+
2. IgG class antibodies
3. IgA class antibodies
4. IgG and IgA class antibodies
5. All of above listed

90. Predominant cytokine promoting immunoglobulin class switch from IgM to other classes:

1. IL-1
2. IL-2
3. IL-3
4. IL-4+
5. γ-Interferon

91. Professional antigenic presenting cells:

1. Granulocytes
2. Dendritic cells+
3. Platelets
4. Natural killer cells
5. Plasma cells

92. The cells able to present endogenous antigens to T-cytotoxic cells:

1. Epithelial cells
2. Fibroblasts
3. Macrophages
4. Hepatocytes
5. All above listed+

93. Immunologic synapse comprises:

1. TCR, processed antigenic peptide, CD4 or CD8 molecules, co-stimulatory molecules
2. TCR, HLA molecule, native antigen
3. TCR, HLA molecule, processed antigenic peptide, CD4 or CD8 molecules
4. TCR, HLA molecule, native antigen, CD4 or CD8 molecules
5. TCR, processed antigenic peptide, HLA molecule, CD4 or CD8 molecules, co-stimulatory molecules+

94. Presentation of antigen to T cells without co-stimulatory signaling results in:

1. Cell necrosis
2. Cell autophagy
3. Cell unresponsiveness (anergy)+
4. Cell proliferation
5. Active cytokine secretion

95. T-dependent immune response comprises below listed phases except:

1. Sensitization phase+
2. Processing and presentation of the antigen
3. Activation of T helpers and T cytotoxic cells
4. Effector phase
5. Immunologic memory

96. Function of proteasome:

1. Scavenging and hydrolysis of extracellular proteins
2. Digestion of intracellular misfolded or alterated proteins
3. Scavenging of cellular alterated proteins as well as processing of intracellular antigens followed by HLA-I dependent presentation+
4. Digestion of intracellular peptides for energy gain
5. Compartment for isolation of cellular proteases

97. Potent cytokines suppressing immune reactions:

1. IL-4, IL-5, IL-6
2. IL-17, IL-18
3. IL-10, β-TGF+
4. GM-CSF, M-CSF, IL-8
5. IL-3, IL-7

98. Th1 promotes:

1. Anaphylactic reactions
2. Immune complex reactions
3. Transformation of B cells into plasma cells
4. Delayed hypersensitivity+
5. Immediate hypersensitivity

99. Essential cytokines of Th2:

1. IL-4, IL-5, IL-10, IL-13+
2. IL-2, γ-interferon, β-TNF
3. IL-1, IL-6, IL-12, IL-18, α-TNF
4. IL-10, β-TGF
5. EGF, TGF, α-interferon, β-interferon

100. Family of pattern-recognizing receptors:

1. Fc-receptors
2. Integrins
2. Selectins
4. Toll-like receptors+
5. Cytokine receptors

101. TLR-4 specifically binds to:

1. Viral double-stranded RNA
2. Bacterial DNA
3. Bacterial lipoproteins
4. Flagellin
5. Bacterial LPS+

102. TLR-2 specifically binds to:

1. Viral double-stranded RNA
2. Bacterial DNA
3. Lipoproteins, lipoteichoic acids, peptidoglycan+
4. Flagellin
5. Bacterial LPS

103. Main cellular reaction of innate immunity against bacterial infections:

1. Complement activation
2. Synthesis of antibodies of IgM, IgG, and IgA classes by plasma cells
3. Activation of cytotoxic T cells
4. Phagocytosis+
5. Acute-phase protein synthesis

104. Primary immune response is characterized by:

1. IgG synthesis
2. IgA synthesis
3. IgE synthesis
4. IgD synthesis
5. IgM synthesis+

105. Memory T-cells bear the receptor:

1. IgG
2. TCR and CD45RO+
3. CD19
4. CD35
5. CD16

106. Membrane-affecting molecule of T cytotoxic cells:

1. Granzyme
2. Perforin+
3. Membrane-attack complex
4. Tryptase
5. Bradykinin

107. Acute-phase proteins of immune response:

1. C-reactive protein
2. Fibronectin
3. Haptoglobin
4. α2-Macroglobulin
5. All above listed+

108. Anti-idiotypic antibodies suppress:

1. Primary antibodies triggered by antigenic epitopes+
2. Phagocyte activity
3. Complement activation
4. Abnormal neuronal proteins in CNS disorders
5. Cytokine secretion

109. Essential cytokines of Th1:

1. IL-2, γ-interferon+
2. IL-4, IL-10, IL-13, IL-15
3. IL-1, IL-6, IL-12, IL-18, α-TNF
4. IL-10, β-TGF
5. IL-3, IL-7

110. Humoral immune response is activated by:

1. Th1
2. Th2+
3. Th3
4. T cytotoxic cells
5. NK-cells

111. Ist type of hypersensitivity (anaphylaxis) is characterized by participation of:

1. IgM antibodies
2. T-cells
3. Defensins
4. IgE antibodies+
5. Neutrophils

112. 2nd type of hypersensitivity (cytotoxic) is characterized by participation of:

1. Basophils
2. Complement system+
3. Mast cells
4. IgE
5. IgD

113. These substances can be allergenic except:

1. Glucose+
2. Drugs
3. Wool
4. Industrial chemicals
5. Foodstuffs

114. Normal value of Th/Tc ratio (immunoregulatory index):

1. Less than 1
2. 1,0-1,5
3. 1,5-2,0+
4. 2,0-3,0
5. More than 3,0

115. Secondary immunodeficiences are stimulated by:

1. Viral infections
2. Chemical environmental pollution
3. Radiation
4. Immunosupressive drugs treatment
5. All above listed+

116. Immediate hypersensitivity manifests after antigenic stimulation in:

1. 30 min – 16 h+
2. 24 h – 36 h
3. 36 h – 48 h
4. 48 h – 72 h
5. About 5 days

117. Main autoantigen for systemic lupus erythematosus:

1. Thyroid gland tissue
2. Testicular tissue
3. Cartilage
4. DNA-protein complex+
5. Human IgG

118. Recombinant vaccine:

1. Influenza vaccine
2. Yellow lever vaccine
3. Hepatitis B vaccine+
4. Smallpox vaccine
5. Anthrax vaccine

119. Functional test for activity of T- or B cells:

1. Complement fixation test
2. Test of lymphocyte blast transformation+
3. Agglutination test
4. NBT test
5. Immune fluorescence with anti-CD4 or anti-CD8 mAbs

120. The function of autoantibody known as LATS-factor:

1. Stimulation of lactation
2. T lymphocyte activation
3. Cytotoxic effect against thyroid cells
4. Cytotoxic effect in lateral amiotrophic sclerosis
5. Activation of thyrotropin receptors in thyroid gland+

121. Thymus dysgenesis is:

1. DiGeorge syndrome+
2. Bruton's syndrome
3. Ataxia telangiectasia
4. Graves' disease
5. Wiskott-Aldrich syndrome

122. Allergy mediator:

1. Pepsin
2. Trypsin
3. Thyrotropin
4. Prostaglandin+
5. Laminin

123. T-cell mitogen:

1. Hemagglutinin
2. Phytohemagglutinin+
3. Agglutinin
4. Agglutinogen
5. Lipopolysaccharide

124. Delayed type of hypersensitivity develops in:

1. 1 h
2. 3 h
3. 6 h
4. 16 h
5. 1-3 days+

125. Immune complex-mediated hypersensitivity is characterized by:

1. Receptor stimulation
2. Receptor blockade
3. Basophil degranulation
4. Direct activation of T- and B cells
5. Vasculitis development+

26. Agammaglobulinemia is:

1. DiGeorge syndrome
2. Graves' disease
3. Bruton's syndrome+
4. Wiskott-Aldrich syndrome
5. Quincke's disease

127. Tularin skin test evaluates:

1. 1st type of hypersensitivity
2. 2nd type of hypersensitivity
3. 3rd type of hypersensitivity
4. 4th type of hypersensitivity+
5. 5th type of hypersensitivity

128. Type of hypersensitivity characterized by antibody-dependent cell cytotoxity (ADCC):

1. Anaphylactic hypersensitivity
2. Cytotoxic hypersensitivity+
3. Immune-complex-mediated hypersensitivity
4. Cell-mediated hypersensitivity
5. Stimulatory and blocking hypersensitivity

129. Serum sickness develops according to:

1. Cell-mediated hypersensitivity
2. IgE-mediated reactions
3. Anti-receptor reactions
4. Immune complex-mediated reactions+
5. Antibody-dependent cell cytotoxity (ADCC)

130. BCG is used for:

1. Tuberculosis specific prophylaxis+
2. Skin testing in tuberculosis
3. Tuberculosis chemotherapy
4. Specific tuberculosis treatment
5. Serologic diagnosis of tuberculosis

131. Autoantigen, characteristic for rheumatoid arthritis:

1. NADPH-oxidase
2. Osteon
3. Hyaluronic acid
4. DNA-protein complex
5. Fc-fragment of human immunoglobulins+

132. NBT test evaluates

1. Respiratory burst in phagocytes+
2. B- and T cell proliferation
3. Phagocyte number
4. Leukocyte migration
5. Presentation of antigens

133. Condition, necessary for infectious process development:

1. Body susceptibility to certain pathogen+
2. Source of infection presence
3. Susceptible population presence
4. Mechanisms of disease transmission
5. Vector presence

134. The source of infection in zoonoses:

1. Contaminated hands
2. Contaminated foodstuff
3. Sick animal+
4. Sick human
5. Ticks

135. Possible source of infection:

1. Fly
2. Soil
3. Air
4. Water
5. Carrier animal+

136. Restricted by time and area sharp rise of the disease incidence:

1. Sporadic
2. Outbreak+
3. Epidemic
4. Endemic
5. Pandemic

137. The period from the moment of infection till the first symptoms appearance:

1. Incubation period+
2. Prodromal period
3. Height of the disease
4. Outcome period
5. Sensitization period

138. Botulotoxin action:

1. Protein synthesis inhibition
2. Proteolytic degradation of neuronal proteins+
3. Disruption of cell membrane
4. Superantigen action
5. Activation of secondary messengers

139. Nature of exotoxin:

1. Lipid
2. LPS
3. Polysaccharide
4. Nucleic acid derivative
5. Protein+

140. Invasive factors:

1. Oxydase
2. Hyaluronidase+
3. Pili
4. Fimbria
5. Flagella

141. Bacteremia means:

1. Bacteria enter the blood stream, but not multiply there+
2. Bacteria enter the blood stream being able to propagate in blood
3. Bacteria are able to propagate in the blood with purulent foci creation
4. Bacteria produce toxins in blood
5. Bacteria persist in blood cells, e.g. phagocytes

142. "Artificial" mechanism of disease transmission is provided by:

1. Airborne route
2. Water route
3. Vectors
4. Insect bites.
5. Parenteral injections+

143. Bacteria, producing powerful enterotoxin:

1. C. diphtheria
2. C. tetani
3. H. pylori
4. V. cholerae+
5. S. pyogenes

144. Condition, necessary for epidemic process development:

1. Pathogenic causative agent presence
2. Source of infection presence+
3. Organism susceptibility to certain pathogen
4. Presence of the reservoir of infection
5. Pathogen's ability to penetrate and invade the body

145. The source of infection in anthroponoses:

1. Sick animal
2. Contaminated hands
3. Sick human+
4. Sick rodent
5. Contaminated utensils

146. Disease spread restricted in some locality:

1. Sporadic
2. Outbreak
3. Epidemic
4. Endemic+
5. Pandemic

147. Cellular sites for superantigen binding:

1. B cell Ab receptor
2. CD16 on granulocytes
3. T cell receptor, variable domains+
4. T cell receptor, constant domains
5. Integrin receptor upon dendritic cells

148. The trait essential only for infectious disease:

1. Contagious spread+
2. Fever
3. Headache
4. Nausea and vomiting
5. Skin rashes

149. Diphtheria toxin action:

1. Intracellular protease activity
2. Disruption of cell membrane
3. Activation of secondary messengers
4. Protein synthesis inhibition+
5. Superantigen action

150. Nature of endotoxin:

1. Protein-metal complex
3. Polysaccharide
2. LPS+
4. Short-chain peptide
5. Nucleoprotein

151. Adhesion factors:

1. Mesosomes
2. Superantigens
3. Fimbria+
4. Adenylate cyclase
5. G-proteins

152. Septicemia means:

1. Bacteria enter the blood stream, but not multiply there
2. Bacteria enter the blood stream being able to propagate in blood+
3. Bacteria are able to propagate in the blood with purulent foci emergence
4. Bacteria produce toxins in the blood
5. Bacteria persist in organs or tissues

153. Contact route of disease transmission is provided by:

1. Airborne route
2. Water route
3. Vectors
4. Sexual intercourse+
5. Insect bites

154. Pathogenic activity of injectisome as function of bacterial type III secretion system:

1. Antibiotic secretion
2. Targeted delivery of virulence factors (effector proteins) into affected cell+
3. Excretion of bacterial wastes (scavenging function)
4. Transfer of bacterial nucleic acids into target cell
5. Electrolyte and water exchange

Section 3.
Medical Bacteriology

1. Typical morphology of staphylococci:

    1. Gram-negative micrococci
    2. Gram-positive long chains
    3. Gram-positive grape-like assembled cocci+
    4. Gram-negative tetrads
    5. Gram-positive bundle of cocci

2. Selective medium for *S. aureus*:

    1. Yolk-salt agar+
    2. Blood agar
    3. McConkey agar
    4. Kitt-Tarozzi medium
    5. Milk agar

3. Respiration type of *Pseudomonas aeruginosa*:

    1. Facultative anaerobe
    2. Microaerophilic bacteria
    3. Aerotolerant bacteria
    4. Obligate aerobe+
    5. Obligate anaerobe

4. Mechanism of staphylococcal beta-hemolysin action:

    1. Pore-forming toxin
    2. Superantigen
    3. Membrane-affecting enzyme+
    4. Inhibitor of cellular protein synthesis
    5. Metal-dependent protease

5. Mechanism of staphylococcal toxic shock syndrome toxin action:

1. Pore-forming toxin
2. Activator of secondary intracellular messengers
3. Inhibitor of cellular protein synthesis
4. Metal-dependent protease
5. Superantigen+

6. Specific infection caused by *S. aureus*:

1. Staphylococcal abscess
2. Staphylococcal scalded skin syndrome+
3. Staphylococcal septicemia
4. Staphylococcal osteomyelitis
5. Staphylococcal phlegmona

7. Incorrect statement:

1. *Pseudomonas aeruginosa* is a wide spread nosocomial pathogen
2. *Pseudomonas aeruginosa* produce potent exotoxins
3. *Pseudomonas aeruginosa* readily survives in the environment
4. *Pseudomonas aeruginosa* ferments glucose+
5. *Pseudomonas aeruginosa* displays extremely high resistance to antibiotics

8. The enzyme, absent in anaerobes:

1. Dehydrogenase
2. Penicillinase
3. Phospholipase
4. Oxydase+
5. Hyaluronidase

9. Most suitable antibiotic for anaerobic infection treatment:

1. Tetracycline
2. Gentamycin
3. Clindamycin+
4. Erythromycin
5. Biseptol

10. Type of immunity appeared after anti-staphylococcal immunoglobulin administration:

1. Artificial active
2. Artificial passive+
3. Natural active
4. Natural passive
5. Nonsterile

11. Genetic alteration in MRSA staphylococci

1. Acquisition of beta-lactamase genes
2. Acquisition of R-plasmid
3. Alteration of genes controlling antibiotic efflux
4. Phase variation of genes encoding peptidoglycan synthesis
5. Carriage of gene encoding low-affinity *PBP2a* transpeptidase+

12. Typical morphology of *Pseudomonas aeruginosa*:

1. Gram-negative non-motile rods
2. Gram-positive motile rods
3. Gram-negative streptobacteria
4. Gram-negative monotrichate bacteria+
5. Gram-positive motile bacteria

13. These staphylococci are coagulase-negative except:

1. *S. aureus*+
2. *S. saprophyticus*
3. *S. epidermidis*
4. *S. schleifeiri*
5. *S. hominis*

14. Selective medium for *Pseudomonas aeruginosa*:

1. Blood agar
2. Yolk-salt agar
3. Bile salt agar
4. McConkey agar
5. Acetamide agar+

15. Mechanism of staphylococcal alpha-toxin action:

1. Superantigen
2. Pore-forming toxin+
3. Activator of secondary intracellular messengers
4. Inhibitor of cellular protein synthesis
5. Metal-dependent protease

16. Mechanism of *Pseudomonas aeruginosa* exotoxin A action:

1. Pore-forming toxin
2. Superantigen
3. Inhibitor of cellular protein synthesis+
4. Activator of secondary intracellular messengers
5. Metal-dependent protease

17. Severe infection, caused by *S. epidermidis*:

1. Pneumonia in farmers
3. Wound infections in surgical patients
2. Endocarditis in patients with prosthetic devices+
4. Periostitis in soccer players
5. Scalded skin syndrome in newborns

18. Bacterial pigment, essential for *P. aeruginosa*:

1. Carotenoid pigment
2. Pyocyanin+
3. Quinone pigment
4. Prodigiozin
5. None of above listed

19. Laboratory method for rapid diagnosis of anaerobic infections:

1. Hemagglutination inhibition test
2. Anaerobic jar cultivation
3. Blood agar cultivation
4. Gas-liquid chromatography+
5. Immune electrophoresis

20. Anti-pseudomonadal penicillin:

1. Penicillin G
2. Ampicillin
3. Amoxicillin
4. Oxacillin
5. Mezlocillin+

21. Most active bacteroidal pathogen:

1. *B. fragilis*+
2. *B. ovatus*
3. *B. vulgatus*
4. *B. thetaiotaomicron*
5. *B. pyogenes*

22. Antibiotic for treatment of MRSA infection:

1. Ceftazidime
2. Vancomycin+
3. Oxacillin
4. Amoxicillin
5. Ticarcillin

23. Typical morphology of streptococci:

1. Gram-negative micrococci
2. Gram-negative diplococci
3. Gram-positive chains+
4. Gram-positive grape-like assembled cocci
5. Gram-positive tetrads

24. *S. pneumoniae* belongs to the next Lancefield group:

1. Group A
2. Group B
3. Group H
4. Group D
5. It is out of Lancefield classification+

25. Causative agent of caries:

1. *S. pyogenes*
2. *S. agalactiae*
3. *S. mutans*+
4. *S. sanguis*
5. *E. fecalis*

26. Test, essential for *S. agalactiae*:

1. Esculin fermentation
2. Inulin fermentation
3. Beta-hemolysis
4. CAMP-test+
5. Catalase test

27. Mechanism of action of streptococcal pyrogenic exotoxins A and C:

1. Pore-forming toxins
2. Activators of secondary intracellular messengers
3. Superantigens+
4. Inhibitors of cellular protein synthesis
5. Metal-dependent protease

28. Major mechanism of streptococcal M protein action:

1. Superantigen
2. Impairment of streptococci opsonization+
3. Hydrolysis of human IgG
4. Activation of tissue metalloproteases
5. Cell membrane damage

29. Serologic diagnosis of streptococcal infections is performed by:

1. Anti-pyrogenic toxin test
2. Anti-M protein test
3. Anti-lipoteichoic acid test
4. Anti-streptolysin O test+
5. Capsule swelling reaction

30. Medium for cultivation of *C. tetani*:

1. Kitt-Tarozzi medium+
2. McConkey medium
3. Bile agar
4. Eosyne-methylene blue agar
5. Milk agar

31. Survival time for clostridia spores in the environment:

1. 1 week
2. 1 month
3. Several months
4. About 1 year
5. More than 1 year+

32. Clostridia, possessing capsule:

1. *C. novyi*
2. *C. septicum*
3. *C. hystolyticum*
4. *C. perfringens*+
5. *C. tetani*

33. Specific treatment of gas gangrene:

1. Antibiotic treatment
2. Surgical treatment
4. Antiprotease treatment
4. Antitoxin treatment+
5. Hyperbaric oxygenation

34. Typical morphology of *Clostridium perfringens*:

1. Gram-negative non-motile sporeforming rods
2. Gram-positive non-motile sporeforming rods+
3. Gram-positive motile sporeforming rods
4. Gram-positive streptobacteria
5. Gram-negative motile bacteria

35. Group B streptococci:

1. *S. agalactiae*+
2. *S. pyogenes*
3. *S. mutans*
4. *S. sanguis*
5. *E. fecalis*

36. Biochemical property, essential for streptococci:

1. Catalase-negative+
2. Esculin fermentation
3. Coagulase-positive
4. Potent proteolytic activity
5. CAMP-test

37. Mechanism of perfringens alpha-toxin action:

1. Superantigen
2. Guanylate cyclase activation
3. Inhibitor of cellular protein synthesis
4. Metal-dependent protease
5. Enzyme with phospholipase activity+

38. Mechanism of action of streptococcal pyrogenic exotoxin B:

1. Pore-forming toxin
2. IL-1-affecting cystein proteinase+
3. Superantigen
4. Activator of secondary intracellular messengers
5. Inhibitors of cellular protein synthesis

39. Specific infection, caused by *S. pyogenes*:

1. Hospital-acquired pneumonia
2. Erysipelas+
3. Wound infection
4. Meningitis
5. Scalded skin syndrome

40. Major mechanism responsible for rheumatic heart disease development:

1. Streptococcal hemolysin action
2. Specific streptococcal proteolysis of heart tissues
3. Molecular mimicry of streptococcal M protein with heart tissue substances+
4. Streptodornase action, resulting in cell DNA hydrolysis
5. Direct cell membrane damage

41. Laboratory method for determination of tetanus toxin strength:

1. Slide agglutination
2. Complement fixation test
3. Neutralization reaction+
4. Molecular hybridization
5. PCR

42. DPT vaccine is composed of:

1. Tetanus, pertussis and diphtheria toxoids
2. Killed streptococci of D group, killed pertussis bacteria, tetanus toxoid
3. Killed bacteria of tetanus, pertussis and diphtheria
4. Killed pertussis bacteria, tetanus and diphtheria toxoids+
5. Killed pneumococci, tetanus and diphtheria toxoids

43. Antibiotics for treatment of enterococcal infections:

1. Combination of vancomycin and aminoglycosides+
2. Fluoroquinolones
3. Chloramphenicol
4. Doxycycline
5. Combination of cephalosporins and tetracyclines

44. Cornerstone in urgent therapy of tetanus:

1. Toxoid administration
2. Anti-toxic antibodies administration+
3. Antibiotic treatment
4. Infusive detoxication therapy
5. Sedative therapy

45. Typical morphology of *E. coli*:

1. Gram-positive motile rods
2. Gram-negative motile rods+
3. Gram-negative non-motile rods
4. Gram-positive non-motile rods
5. Gram-negative motile diplobacteria

46. Shigella genus comprises below listed species except:

1. *S. dysenteriae*
2. *S. flexneri*
3. *S. boydii*
4. *S. derby*+
5. *S. sonnei*

47. Antigen composition of *E. coli*:

1. O-Ag only
2. O- and H-antigens
3. O-, H-, and K-antigens+
4. O-, H-, K- and Vi-antigens
5. O- and K-antigens

48. Growth characteristics of *E. coli* on EMB agar:

1. Dark blue lactose-positive colonies+
2. Red lactose-positive colonies
3. Transparent lactose-negative colonies
4. Pinkish lactose-positive colonies
5. Dark blue lactose-negative colonies

49. Mechanism of verotoxin action:

1. Pore-forming toxin
2. Superantigen
3. Activator of secondary intracellular messengers
4. Proteolytic activity
5. Inhibitors of cellular protein synthesis+

50. Most frequent of *E. coli* opportunistic infections:

1. Cystitis or pyelonephritis+
2. Appendicitis
3. Cholecystitis
4. Meningitis
5. Septicemia

51. Adhesin, responsible for specific adherence of pathogenic *E. coli*:

1. CD14
2. Intimin+
3. Bacterial LPS
4. Selectin
5. Integrin

52. Shigella virulence is predominantly encoded by:

1. Nucleoid
2. Temperate bacteriophage
3. Small plasmid
4. Large plasmid+
5. Transfected DNA from external source

53. Microbial properties, allowing the correct identification of coli-enteritis causative agents:

1. Morphology
2. Growth characteristics
3. Biochemical properties
4. Anibiotic resistance
5. Antigenic properties+

54. Appropriate antibiotic for shigellosis treatment:

1. Benzyl-penicillin
2. Linezolid
3. Vancomycin
4. Ciprofloxacin+
5. Cefalexin

55. Most severe complication of enterohemorrhagic *E. coli* infections:

1. Acute heart failure
2. Hemolytic uremic syndrome with acute renal failure+
3. Massive water loss
4. Electrolyte disturbances
5. Septicemia

56. Typical morphology of shigellae:

1. Gram-negative non-motile rods+
2. Gram-positive motile rods
3. Gram-positive non-motile rods
4. Gram-negative non-motile rods with spores
5. Gram-negative motile bacteria

57. Enterobacteria representatives include below listed genera except:

1. *Klebsiella*
2. *Yersinia*
3. *Moraxella*+
4. *Morganella*
5. *Providencia*

58. Biochemical property, typical for all enterobacteria:

1. Lactose fermentation
2. Potent proteolytic activity
3. Carbohydrate fermentation with acid and gas production
4. Catalase-negative
5. Oxydase-negative+

59. Antigen composition of *S. flexneri*:

1. O-Ag only
2. O- and H-antigens
3. O-, H-, and K-antigens
4. O- and K-antigens+
5. O-, H-, K- and Vi-antigens

60. Antigenic formula of the most aggressive enterohemorrhagic *E. coli*:

1. O111 : H8
2. O26 : H2
3. O55 : H10
4. O104 : H3
5. O157 : H7+

61. Mechanism of *E. coli* enterotoxin action:

1. Pore-forming toxin
2. Superantigen
3. Activator of secondary intracellular messengers+
4. Inhibitors of cellular protein synthesis
5. Metal-dependent protease

62. Pathogenic *E. coli* representatives very similar with shigellae:

1. Enteropathogenic *E. coli*
2. Enterohemorrhagic *E. coli*+
3. Uropathogenic *E. coli*
4. Enteroaggregative *E. coli*
5. Enterotoxigenic *E. coli*

63. Minimal infectious dose for enterohemorrhagic *E. coli* infection:

1. 1-100 cells+
2. 100-300 cells
3. 300-1000 cells
4. Several thousands
5. 100 000 and more

64. Shigellae that cause the most of water-born outbreaks:

1. *S. dysenteriae*
2. *S. flexneri*+
3. *S. boydii*
4. *S. sonnei*
5. Any species is the potential agent of massive water-born outbreaks of shigellosis

65. Futile method for laboratory diagnosis of shigellosis:

1. Bright field microscopy+
2. Planting on McConkey agar
3. Russel's medium culturing
4. Determination of antigenic properties
5. Determination of carbohydrate fermentation

66. Molecular mechanism ensuring shigella intercellular lateral spread:

1. Cellular membrane engulfment
2. Transportation by phagocytes
3. Vacuole formation
4. Actin comet formation+
5. Flagella movement

67. Typical morphology of salmonellae:

1. Gram-negative non-motile rods
2. Gram-positive non-motile rods
3. Gram-positive motile rods
4. Gram-negative motile rods+
5. Gram-negative comma-shaped bacteria

68. One of the most common causative agents of salmonellosis with gastroenteritis:

1. S. Typhi
2. S. Paratyphi C
3. S. Enteritidis+
4. *S. boydii*
5. S. London

69. Factor of salmonella virulence released after microbial degradation:

1. LPS+
2. Flagellin
3. Secretory proteins
4. Enterotoxin
5. Vi-antigen

70. Growth characteristics of salmonellae on McConkey agar:

1. Red lactose-positive colonies
2. Dark blue lactose-positive colonies
3. Pinkish lactose-positive colonies
4. Dark blue lactose-negative colonies
5. Transparent lactose-negative colonies+

71. Salmonellae representatives, devoid of ability to produce hydrogen sulfide:

1. S. Typhimurium
2. S. Paratyphi A+
3. S. Paratyphi B
4. S. Typhi
5. S. Anatum

72. Kauffmann-White scheme of salmonella serotyping comprises:

1. Group determination according to specific O-Ag fraction followed by species identification by first phase of H-Ag+
2. Group determination according to specific O-Ag fraction followed by species identification by second phase of H-Ag
3. Group determination according to common O-Ag fraction followed by species identification by second phase of H-Ag
4. Group determination according to specific phase of H-Ag followed by species identification by specific O-Ag fraction
5. Group determination according to specific O-Ag fraction followed by species identification by Vi-Ag

73. Macrophage receptor, responsible for specific interaction with LPS endotoxin:

1. CD14+
2. CD11a/CD18
3. CD16
4. CD32
5. CD35

74. The material for microbial examination should be taken at the first week of enteric typhoid fever:

1. Stool
2. Urine
3. Bone marrow
4. Cerebrospinal fluid
5. Blood+

75. Laboratory test for detection of salmonella carriers:

1. Widal's test tube agglutination
2. Cultural method
3. Luminescent microscopy
4. Indirect Vi-hemagglutination test+
5. Kauffmann-White agglutination test

76. Elevated level of antibodies in enteric fever convalescent persons results from:

1. Anti-Vi-Ag antibodies
2. Anti-O-Ag antibodies more than anti-H-Ag antibodies
3. Anti-H-Ag antibodies more than anti-O-Ag antibodies+
4. Anti-K-Ag antibodies
5. Anti-enterotoxin antibodies

77. Vaccine currently used for enteric typhoid fever prophylaxis

1. Inactivated cellular vaccine
2. Chemical Vi-Ag-based vaccine+
3. Chemical O-Ag-based vaccine
4. Typhoid toxoid
5. DNA vaccine

78. Listed below bacterial cells as most similar in morphology with salmonellas:

1. Pseudomonads
2. Klebsiellae
3. Shigellae
4. Escherichiae+
5. Bacilli

79. Salmonella serovar that predominantly cause septicemia in infants:

1. S. Derby
2. S. Anatum
3. S. Choleraesuis
4. S. Moscow
5. S. Typhimurium+

80. Salmonella members, able to ferment lactose with acid end products:

1. S. Typhi+
2. S. Typhimurium
3. S. Paratyphi A
4. S. Paratyphi B
5. S. Enteritidis

81. Antigen composition of S. Typhi:

1. O-Ag only
2. O- and H-antigens
3. O-, H-, and sometimes Vi-antigens+
4. O-, H-, K- and Vi-antigens
5. O- and K-antigens

82. Mechanism of salmonella enterotoxin action:

1. Pore-forming toxin
2. Superantigen
3. Activator of enterocyte adenylate cyclase+
4. Inhibitor of enterocyte protein synthesis
5. Invasion enzyme

83. Salmonella injectisomes are encoded by:

1. Bacterial transposons
2. Bacterial chromosome+
3. Bacterial episome
4. Bacterial plasmids
5. Virulent bacteriophages

84. Inner organ harboring S. Typhi after disease

1. Bladder
2. Gallbladder+
3. Intestine
4. Peyer's patches
5. Spleen

85. Minimal infectious dose for *S. typhi*:

1. 10^2 cells+
2. 10^3 cells
3. 10^5 cells
4. 10^7 cells
5. 10^9 cells

86. Selective medium for salmonella:

1. Sugar broth
2. EMB agar
3. McConkey agar
4. Bismuth sulfite agar+
5. Endo medium

87. Serological criteria for acute enteric fever infection:

1. Serum titer of antibodies to O-Ag is 1/50, titer of antibodies to H-Ag – 1/200
2. Serum titer of antibodies to O-Ag is 1/40, titer of antibodies to H-Ag – 1/40
3. Serum titer of antibodies to O-Ag is 1/400, titer of antibodies to H-Ag – 1/200+
4. Serum titer of antibodies to O-Ag is 1/100, titer of antibodies to H-Ag – 1/100
5. Serum titer of antibodies to Vi-Ag is 1/40

88. Antibiotics preferable for enteric typhoid fever treatment:

1. Chloramphenicol
2. Penicillin
3. Macrolides
4. Tetracyclines
5. Fluoroquinolones+

89. Typical morphology of cholera causative agent:

1. Gram-positive motile spiral agent
2. Gram-negative motile peritrichous bacteria
3. Gram-negative comma-like monotrichious bacteria+
4. Gram-positive motile comma-shaped agent
5. Gram-negative motile sporeforming rod

90. O139 vibrio can evade population immunity owing to:

1. Alteration of LPS-coding genetic cluster+
2. H-antigen phase change
3. Capsule uptake
4. Loss of toxin production
5. Antigenic mimicry

91. Main factor of cholera vibrio virulence:

1. Endotoxin
2. LPS
3. Hyaluronidase
4. Enterotoxin+
5. Neurotoxin

92. Growth characteristics of yersiniae on Endo medium:

1. Pinkish lactose-positive colonies
2. Transparent lactose-negative colonies+
3. Red lactose-positive colonies
4. Dark blue lactose-positive colonies
5. Deep red lactose-negative colonies

93. Biochemical test that makes possible to differentiate *Enterobacteriaceae* and *Vibrionaceae* members:

1. Lactose fermentation
2. Indole production
3. Catalase acivity
4. Oxidase activity+
5. Sucrose fermentation

94. Vibrio receptor for CTX phage:

1. TCP pili+
2. O139 LPS
3. Type III pili
4. Needle complex
5. Mannose-sensitive hemagglutinin

95. Mechanism of *C. botulinum* neurotoxin action:

1. Pore-forming toxin affecting neuronal membranes
2. Superantigen affecting neuronal membranes
3. Activator of secondary intracellular messengers
4. Inhibitor of synaptic protein synthesis
5. Specific protease destroying synaptic proteins+

96. Infectious dose for *V. cholerae*:

1. 10^2 cells
2. 10^3 cells
3. 10^4 cells
4. 10^5 cells
5. 10^6 cells or more+

97. The best growth temperature for yersiniae cultivation:

1. 4°C
2. 25°C+
3. 37°C
4. 42°C
5. 45°C

98. Vaccine used for specific prophylaxis of yersinioses:

1. Inactivated vaccine
2. Attenuated live vaccine
3. Chemical vaccine
4. Sub-unit vaccine
5. None of above listed+

99. Urgent treatment of botulism:

1. Antibiotics administration
2. Injections of polyvalent antitoxic sera+
3. Toxoid administration
4. Infusion therapy for detoxication
5. Urgent vaccination

100. *C. botulinum* resembles:

1. Comma
2. Drumstick
3. Barrel
4. Tennis racket+
5. Lancet

101. Typical morphology of *Yersinia pseudotuberculosis*:

1. Gram-negative non-motile rods
2. Gram-positive non-motile rods
3. Gram-positive motile rods
4. Gram-negative motile rods+
5. Curved or branched acid-fast bacteria

102. Cholera vibrio becomes virulent owing to:

1. Bacterial transformation
2. Temperate phage transduction+
3. Illegitimate recombination
4. Frame-shift mutation
5. Microbial modification

103. Antigenic composition of *V. cholerae*

1. O-Ag
2. O- and H-antigens+
3. O-, H-, and K-antigens
4. S-, R-, and H-antigens
5. O- and K-antigens

104. Selective medium for cholera vibrios:

1. EMB agar
2. Endo medium
3. Muller broth
4. Yolk-salt agar
5. TCBS agar+

105. Life-threatening complication of cholera:

1. Watery diarrhea
2. Lowering of body's temperature
3. Hypovolemic shock+
4. Encephalitis
5. Secondary infection

106. Decisive test for cholera diagnosis:

1. Sucrose fermentation
2. TCBS growth
3. Oxidase test
4. Positive indole test
5. Agglutination test with O1 and O139 antisera+

107. *Yersinia pseudotuberculosis* virulence is predominantly encoded by:

1. Plasmid with pathogenicity island+
2. Nucleoid with pathogenicity island
3. Transposon
4. Temperate bacteriophage
5. DNA from external source with pathogenicity island

108. Minimal sterilization regimen ensuring complete botulotoxin inactivation:

1. Heating at 56°C for 30 minutes
2. Heating at 80°C for 30 minutes
3. Boiling for 1 minute
4. Boiling for 5 minutes
5. Boiling for 10 minutes or more+

109. Urgent treatment of cholera:

1. Antitoxic sera injections
2. Antibacterial drug administration
3. Compensatory infusion therapy+
4. Toxoid administration
5. Urgent vaccination

110. Specific symptoms, indicating manifested botulism onset:

1. Diarrhea
2. Severe headache, dizziness
3. Vomiting, nausea
4. Swallowing troubles, aphonia, diplopia+
5. Dry mouth

111. Morphology of meningococci:

1. Gram-positive long chains
2. Gram-positive bean-shaped diplococci
4. Gram-negative bean-shaped diplococci+
3. Gram-negative short chains
5. Gram-negative irregular cocci

112. Medium for *B. pertussis* cultivation:

1. McConkey medium
2. Bordet-Gengou agar+
3. Kitt-Tarozzi medium
4. Peptone broth
5. Sabouraud agar

113. Major virulence factor of *B. pertussis*:

1. Filamentous hemagglutinin
2. Capsule
3. Pertussis endotoxin
4. Pertussis exotoxin+
5. Hemolysin

114. Meningococcal serogroup is determined by:

1. Outer membrane protein antigens
2. Lipooligosaccharide antigens
3. IgA proteases
4. Antigens of pili
5. Capsular antigens+

115. Most suitable clinical specimen for whooping cough laboratory diagnosis:

1. "Cough plate" sample
2. Saline nasal wash+
3. Sputum
4. Nasopharingeal swab
5. Blood

116. Major virulence factor of meningococci:

1. Endotoxin+
2. Exotoxin
3. Fimbria
4. Capsule
5. Hyaluronidase

117. Colonies of mycoplasma resemble:

1. Dew drops
2. Mercury globules
3. "Fried eggs"+
4. "Hard-boiled eggs"
5. Daisy flowers

118. The symptom, indicating meningococcemia emergence:

1. High fever
2. Rigidity of occipital muscles
3. Severe headache
4. Petechiac rash+
5. Leukocyte presence in cerebrospinal fluid

119. Drug of choice for meningococcal cerebrospinal meningitis treatment:

1. Gentamicin
2. Chloramphenicol
3. Doxycycline
4. Benzyl-penicillin+
5. Azithromycin

120. Specific prophylaxis of whooping cough is performed by:

1. Patients isolation
2. Human immunoglobulin administration
3. Pertussis toxoid
4. BCG vaccine
5. DTP vaccine (cellular or acellular)+

121. Most common form of meningococcal infection:

1. Meningococcal nasopharyngitis
2. Meningococcal carriage+
3. Meningococcal meningitis
4. Meningococcemia
5. Meningococcal pnemonia

122. Typical morphology of whooping cough causative agent:

1. Gram-negative oval-shaped capsulated small rods+
2. Gram-positive non-sporeforming rods
3. Gram-positive bacilli
4. Gram-negative sporeforming capsulated rods
5. Gram-negative bean-shaped diplococci

123. Morphological property, essential for mycoplasmas:

1. Small sizes
2. Intracellular persistence
3. Lack of cell wall+
4. Pleomorphic pathogens
5. Bacterial motility

124. Medium for meningococcal cultivation:

1. McConkey medium
2. Peptone broth
3. Kitt-Tarozzi medium
4. Serum agar+
5. Sabouraud agar

125. Pertussis toxin action:

1. Intracellular protease activity
2. ADP-ribosylating activity with activation of secondary cellular messengers+
3. Disruption of cell membrane
4. Protein synthesis inhibition
5. Increase of vascular permeability

126. Meningococcal serotype is determined by:

1. Capsular antigens
2. Lipooligosaccharide antigens
3. IgA proteases
4. Outer membrane protein antigens+
5. Cytoplasmic antigens

127. Respiratory type of bordetellas:

1. Strict anaerobes
2. Obligate aerobes+
3. Facultative anaerobes
4. Microaerophils
5. Aerotolerant bacteria

128. Predominant source of meningococcal infections:

1. Carrier+
2. Sick person
3. Sick animal
4. Patient with menigococcemia
5. Patient's nasal secretion

129. Minimal significant rise of specific antibody titers for laboratory diagnosis of mycoplasmal pneumonia in paired sera test:

1. Twofold
2. Fourfold+
3. Eightfold
4. Tenfold
5. Greater than 10 times

130. Most sensitive method for laboratory diagnosis of mycoplasma infections:

1. Immune fluorescence
2. Microscopy
3. Cultural method
4. PCR+
5. Serological method

131. Polysaccharide quadrivalent vaccine confers immunity against meningococci of below listed groups except:

1. A group
2. B group+
3. C group
4. Y group
5. W135 group

132. Antibiotic group for treatment of mycoplasmal infections:

1. Beta-lactams
2. Linezolid
3. Aminoglycosides
4. Glycopeptides
5. Azalides+

133. Medium for rapid detection of *M. tuberculosis* growth:

1. Finn medium
2. Middlebrook agar
3. BACTEC system+
4. Soton's medium
5. Lowenstein-Jensen's medium

134. Mycobacteriae that cause mycobacterioses:

1. *M. bovis*
2. *M. leprae*
3. *M. smegmatis*
4. *M. avium-intracellulare*+
5. *M. africanum*

135. Acid-fastness of tubercle bacilli depends on:

1. Thick cell wall
2. Mycolic acid presence+
3. Teichoic acid presence
4. LPS presence
5. Capsule presence

136. Test, essential for virulent *M. tuberculosis*:

1. Cord-factor synthesis+
2. Nitrate reduction
3. Urease production
4. Catalase positive test
5. Growth on salycilate-containing media

137. Chemical structure of tuberculin-PPD:

1. Protein-polysaccharide complex
2. Polysaccharide complex
3. Mycolic acids
4. Waxes and phosphatides
5. Protein complex+

138. *C. diphteriae* looks like:

1. Club+
2. Tennis racket
3. Drumstick
4. Bamboo cane
5. Ovoid rods

139. Medium for culturing of *C. diphteriae*:

1. Lowenstein-Jensen's medium
2. Clauberg II medium+
3. McConkey agar
4. Middlebrook agar
5. Bordet-Gengou medium

140. Property, essential for virulent *C. diphteriae*:

1. Cystinase production
2. Hyaluronidase production
3. Endotoxin presence
4. Capsule production
5. Exotoxin secretion+

141. Minimal protective titer of diphtheria antitoxin in humans, evaluated by indirect hemagglutination test:

1. 1/10
2. 1/20
3. 1/40+
4. 1/80
5. 1/100

142. BCG vaccine confers:

1. Active sterile immunity
2. Passive sterile immunity
3. Passive non-sterile immunity
4. Active non-sterile immunity+
5. Active anti-toxic immunity

143 Tuberculin skin test estimates:

1. Ist type anaphylactic hypersensitivity in tuberculosis
2. IInd type cytotoxic hypersensitivity
3. IIIrd type immune complex-mediated hypersensitivity
4. IVth type cell-mediated hypersensitivity+
5. Anti-receptor autoimmune reactions

144. Mycobacterium that can cause tuberculosis in humans:

1. *M. kansasii*
2. *M. microti*
3. *M. bovis*+
4. *M. smegmatis*
5. *M. avium*

145. Egg-based medium for *M. tuberculosis* cultivation:

1. McConkey medium
2. Middlebrook agar
3. Soton's medium
4. Lowenstein-Jensen's medium+
5. BACTEC broth

146. Rosette-like *C. diphteriae* colonies are of:

1. Gravis type+
2. Mitis type
3. Intermedius type
4. Belfanti variant
5. None of above listed

147. Mechanism of diphtheria exotoxin action:

1. Pore-forming toxin
2. Cytotoxic superantigen
3. Activator of secondary intracellular messengers
4. Metal-dependent protease with cytotoxic activity
5. Inhibitor of cellular protein synthesis via peptide elongation cease+

148. All these media are used for *C. diphteriae* cultivation except:

1. Roux medium
2. Loeffler medium
3. Gengou medium+
4. Clauberg II medium
5. Tinsdal medium

149. Rapidly growing mycobacteria:

1. *M. tuberculosis*
2. *M. bovis*
3. *M. africanum*
4. *M. smegmatis*+
5. *M. avium*

150. Neisser stain reveals:

1. Capsule
2. Volutin granules+
3. Spores
4. Acid-fastness
5. Intracellular persistence

151. Most sensitive and rapid method for diphtheria toxin detection:

1. PCR+
2. Neutralization reaction on mice
3. Cell cultural test
4. Flocculation reaction
5. Immune diffusion

152. The main intervention in urgent therapy of diphtheria:

1. Toxoid administration
2. Treatment with specific serum in sufficient doses+
3. Antibiotic treatment in sufficient doses
4. Massive infusion therapy for detoxication
5. Urgent DPT injections

153. Listed below antibiotics are the first-raw drugs for tuberculosis treatment except:

1. Isoniazid
2. Pyrazinamide
3. Cycloserine+
4. Rifampin
5. Streptomycin

154. Multi-drug resistant or MDR *M. tuberculosis* demonstrates:

1. Resistance to pyrazinamide and streptomycin
2. Resistance to isoniazid and streptomycin
3. Resistance to rifampin and streptomycin
4. Resistance to isoniazid and rifampin+
5. Resistance to rifampin and fluoroquinolones

155. Morphology of plague causative agent:

1. Gram-positive rods
2. Gram-negative ovoid rods+
3. Gram-positive bipolar cocci
4. Gram-negative long rods
5. Gram-negative irregular cocci

156. Main vehicle for plague transmission:

1. Flies
2. Rats
3. Fleas+
4. Gophers
5. Marmots

157. Genetic element of *Y. pestis* virulence, encoding Yop virulon:

1. Transposon
2. Plasmid+
3. Nucleoid
4. Bacteriophage
5. Foreign DNA

158. Most frequent clinical form of anthrax:

1. Cutaneous+
2. Gastrointestinal
3. Pulmonary
4. Septicemic
5. Wool-sorter's disease

159. Brucellae species, affecting goats and sheep:

1. *B. suis*
2. *B. abortus*
3. *B. canis*
4. *B. neotomae*
5. *B. melitensis*+

160. Tube dilution test for serologic diagnosis of brucellosis:

1. Burne's test
2. Ascoli's test
3. Huddleson's test
4. Wright's test+
5. Widal's test

161. Most invasive bacteria that can penetrate through intact skin:

1. Bordetellae
2. Brucellae
3. Staphylococci
4. Francisellae+
5. Yersiniae

162. Respiratory type of francisellae:

1. Strict anaerobes
2. Obligate aerobes+
3. Facultative anaerobes
4. Microaerophils
5. Aerotolerant bacteria

163. Skin test with tularin predominantly evaluates:

1. Cell-mediated delayed hypersensitivity+
2. Anaphylactic hypersensitivity
3. Cytotoxic hypersensitivity
4. Immune complex-mediated hypersensitivity
5. Antibody-dependent cell cytotoxicity

164. Specific prophylaxis of plague is performed by:

1. EV vaccine+
2. DTP vaccine
3. BCG vaccine
4. Killed non-capsulated vaccine
5. Recombinant vaccine

165. *Y. pestis* aggressively dampens host immune response resulting in:

1. T helper cells blockade
2. NK cells attrition
3. Severe phagocytosis inhibition+
4. Thymocytes maturation arrest
5. Awry antibody synthesis by plasma cells

166. Morphology of *B. anthracis*:

1. Gram-positive non-sporeforming large rods
2. Gram-positive sporeforming capsulated large rods+
3. Gram-positive oval-shaped capsulated cocci
4. Gram-negative non-sporeforming large rods
5. Gram-negative motile large rods

167. Plague form that provides human-to-human disease transmission:

1. Cutaneous form
2. Bubonic form
3. Pneumonic form+
4. Intestinal form
5. Septicemic form

168. Property that distinguishes *Yersinia pestis* from *Yersinia pseudotuberculosis*

1. Motility+
2. Spore presence
3. Cell wall structure
4. Injectisome presence
5. Nothing of above listed

169. *B. anthracis* colonies resemble:

1. Fried eggs
2. Pearl necklace
3. Lion mane
4. Crumpled lace handkerchief+
5. Globules of mercury

170. Test for *B. anthracis* antigen detection in various raws (skin, hair, etc.):

1. Indirect hemagglutination
2. PCR
3. Complement fixating test
4. Agglutination reaction
5. Thermoprecipitation+

171. Respiratory type of brucellae:

1. Microaerophils
2. Obligate aerobes+
3. Facultative anaerobes
4. Strict anaerobes
5. Aerotolerant bacteria

172. Diagnostic titer of Wright reaction:

1. 1:10
2. 1:20
3. 1:50
4. 1:200+
5. 1:320

173. These media can be used for brucellae and francisellae cultivation except:

1. Chocolate agar
2. Serum agar with cystein
3. Meat-peptone agar+
4. Glucose blood agar
5. Liver extraction agar

174. These clinical forms are characteristic for tularemia except:

1. Bubonic+
2. Pneumonic
3. Oculoglandular
4. Ulceroglandular
5. Typhoidal

175. Vaccine for tularemia prophylaxis:

1. Killed vaccine
2. Subunit vaccine
3. Live attenuated vaccine+
4. Chemical vaccine
5. Recombinant vaccine

176. Molecular mechanism of anthrax lethal toxin action:

1. Membrane damage (pore-forming toxin)
2. Activation of CD95-mediated apoptosis
3. Stimulation of adenylate cyclase resulting in tissue edema
4. Deregulation of intracellular signal transmission – hydrolysis of MAPK-kinase+
5. Superantigen triggering systemic inflammatory response

177. Morphology of gonococci:

1. Micrococci
2. Diplococci+
3. Tetracocci
4. Streptococci
5. Staphylococci

178. Morphology of *T. pallidum*:

1. Comma-like twisted bacteria
2. Spirochetes with large hooks on the ends
3. Branched flagellated bacteria
4. Twisted bacterial forms with 8-15 regular coils+
5. Spirochetes with loose irregular large coils

179. The mechanism of natural mycoplasmal resistance to beta-lactams:

1. Pleomorphic bacteria
2. Slow reproduction
3. Beta-lactamase production
4. Cell wall absence+
5. Accelerated efflux of beta-lactams

180. Minimal infectious dose of treponemas that can cause syphilis:

1. Several microbial cells+
2. About 100 cells
3. In the range 10^2-10^3 cells
4. 10^3-10^4 cells
5. More than 10^5 cells

181. The main symptom of tertiary syphilis:

1. Skin rushes
2. Gummas+
3. Hutchinson's triad
4. Regional lymphadenitis
5. Hard chancre

182. The method for laboratory diagnosis of primary syphilis:

1. Animal inoculation
2. Wasserman reaction
3. VDRL test
4. Treponemal immobilization test
5. Microscopy+

183. Drug of choice for syphilis treatment:

1. Streptomycin
2. Erythromycin
3. Penicillin+
4. Vancomycin
5. None of above listed

184. Main complication in gonorrhoea:

1. Infertility+
2. Generalization of disease
3. Immunodeficiency
4. Endocarditis
5. Progression of other sexually transmitted diseases

185. Ophthalmia neonatorum is caused by:

1. Chlamydia
2. Mycoplasma
3. Meningococci
4. Gonococci+
5. Staphylococci

186. Most suitable antibiotics for treatment of chlamydioses from listed below:

1. Penicillins
2. Cephalosporins
3. Tetracyclines or macrolides+
4. Vancomycin
5. Amphotericin B

187. The origin of expanding treatment failures in gonorrhoea:

1. Growing disease incidence
2. Intracellular persistence of gonococci
3. Incomplete phagocytosis of bacteria
4. Elevated cost of treatment
5. Rapidly progressing gonococcal resistance to antibiotics+

188. These traits are equal in gonococci and meningococci except:

1. Gram-negative cell wall
2. Bean-shaped diplococci
3. Require special media for growth
4. Flagella absence
5. Capsule presence+

189. Gonococci can grow:

1. In anaerobic conditions
2. In media with bile salts
3. In serum or ascitic agar+
4. In ordinary media
5. At room temperature

190. This statement is incorrect for chlamydiae:

1. Grow in special nutrient media+
2. Elementary bodies are the invasive form of chlamidiae
3. Can grow in various cell lines
4. Cannot synthesize ATP
5. Doxycycline is effective in chlamydiosis treatment

191. Seronegative stage of syphilis:

1. Primary+
2. Secondary
3. Tertiary
4. Latent syphilis
5. Congenital syphilis

192. The main symptom of primary syphilis:

1. Gummas
2. Hard chancre+
3. Skin rush
4. CNS disorders
5. Regional lymphadenitis

193. All these tests are specific in syphilis except:

1. Fluorescent treponemal antibody absorption test
2. T. pallidum immobilization test
3. VRDL reaction+
4. Wasserman reaction with treponemal antigen
5. Microhemagglutination test

194. These tests are implicated into laboratory diagnosis of gonorrhoea except:

1. Microscopy
2. Serological testing+
3. Culture test
4. Immune fluorescence
5. PCR

195. Prevention of syphilis is achieved by:

1. Autovaccine administration
2. Multiple injections of killed vaccine
3. Vaccination with live attenuated vaccine
4. Single dose administration of recombinant vaccine
5. Non-specific prophylaxis+

196. Mycoplasmas are resistant to below listed drugs except:

1. Penicillin
2. Ceftriaxone
3. Vancomycin
4. Azithromycin+
5. Amoxycillin

197. Method for prevention of ophthalmia neonatorum in newborns:

1. Vaccination
2. Passive prophylaxis
3. Systemic antibiotic treatment
4. Eye instillations with antibiotics or antiseptics+
5. Disinfection of linen and utensils

198. Wasserman reaction is based on:

1. Precipitation test
2. Microhemagglutination test
3. Complement fixation test+
4. ELISA test
5. *T. pallidum* immobilization test

199. Most tightly packed spiral bacteria:

1. *Leptospira interrogans*+
2. *Borrelia recurrentis*
3. *Treponema pallidum*
4. *Borrelia burgdorferi*
5. *Spirilla minor*

200. The basic morphological traits of rickettsiae:

1. Cocci
2. Rods
3. Bacilli
4. Pleomorphic bacteria+
5. Thread-like forms

201. All of these borreliae can cause Lyme disease except:

1. *Borrelia garinii*
2. *Borrelia afzelii*
3. *Borrelia duttonii*+
4. *Borrelia bissettii*
5. *Borrelia burgdorferi*

202. Brill-Zinsser disease is caused by:

1. *Borrelia hispanica*
2. *Rickettsia conorii*
3. *Orientia tsutsugamushi*
4. *Rickettsiae provazekii*+
5. *Borrelia afzelii*

203. Predominant class of specific antibodies in Brill-Zinsser disease:

1. IgM
2. IgG+
3. IgA
4. IgE
5. IgD

204. The main source of infection in epidemic typhoid fever:

1. Fleas
2. Ticks
3. Rodents
4. Lice
5. Humans+

205. The most routinely used method for diagnosis of Lyme disease:

1. Microscopy
2. Culture isolation
3. PCR
4. Animal inoculation
5. Serologic testing+

206. The main route of transmission for Lyme disease:

1. Via louse bite
2. Via louse crush with subsequent rubbing of louse hemolymph
3. Via tick bite+
4. Via flea bite
5. Via rodent bite

207. Choose the anthroponotic disease:

1. Leptospirosis
2. Rocky Mountain spotted fever
3. Epidemic relapsing fever+
4. Endemic typhus
5. Lyme borreliosis

208. Coxiellae are resistant to:

1. Fluoroquinolones
2. Beta-lactams+
3. Doxycycline
4. Azalides
5. Macrolides

209. Predominant route of transmission in Q-fever:

1. Air-dust or air-droplet route+
2. Contact route
3. Parenteral route
4. Via louse bite
5. Water route

210. Choose the obligate aerobic bacteria:

1. *Borrelia burgdorferi*
2. *Treponema pallidum*
3. *Leptospira interrogans*+
4. *Rickettsiae typhi*
5. *Borrelia recurrentis*

211. Choose the obligate intracellular parasite:

1. *Borrelia persica*
2. *Rickettsiae provazekii*+
3. *Treponema pallidum*
4. *Borrelia recurrentis*
5. *Leptospira interrogans*

212. Most preferable method for rickettsia microscopy:

1. Gram stain
2. Ziehl-Neelsen stain
3. Gimenez stain+
4. Dark field microscopy
5. Neisser stain

213. Microorganism that is most resistant in the environment:

1. *Coxiella burnetii*+
2. *Borrelia recurrentis*
3. *Rickettsiae typhi*
4. *Treponema pallidum*
5. *Orientia tsutsugamishi*

214. The main source of infection in endemic typhus:

1. Lice
2. Rodents+
3. Ticks
4. Fleas
5. Humans

215. Current emerging diseases:

1. Typhoid diseases
2. Rickettsioses from spotted fever group+
3. Epidemic relapsing fever
4. Leptospirosis
5. Brill-Zinsser disease

216. The most routinely used method for diagnosis of epidemic relapsing fever:

1. Blood culture isolation
2. Microscopy of blood+
3. Serologic testing
4. PCR
5. Animal inoculation

217. Predominant factor that supports leptospirosis transmission:

1. Air
2. Soil
3. Water+
4. Dirty hands
5. Flies

218. The main localization of *R. provazekii* persistence:

1. Phagocytes
2. Renal tubules
3. Hepatocytes
4. Cytoplasm and nuclei of affected cells
5. Cytoplasm of endothelial cells+

219. First clinical finding in Lyme disease:

1. Acrodermatitis chronica atrophicans
2. Oligoarthritis
3. CNS disorders
4. Myocarditis
5. Erythema migrans+

220. Post-exposure prophylaxis of Lyme disease after tick bite includes:

1. Medical observation of affected person
2. Early vaccination in 1-3 days
3. Passive protection with human immunoglobulin
4. Course treatment with amoxicillin or doxycycline+
5. Course treatment with sulfonamides

Section 4.
Medical Virology

1. The basic viral property:

    1. Contains protein-synthesis systems
    2. Capable to grow on simple nutrient media
    3. Extracellular propagation
    4. Intracellular parasitism+
    5. Devoid of nucleic acid

2. Impossible variant of viral genome:

    1. Single-stranded RNA
    2. Double-stranded RNA
    3. Pair of identical RNA
    4. Double-stranded DNA
    5. Double-stranded DNA-RNA complex+

3. The methods, used for laboratory diagnosis of viral infections:

    1. Immune state evaluation
    2. Paired sera serological test+
    3. Inoculation into nutrient medium
    4. Biochemical properties evaluation
    5. None of above listed

4. Mode of viral nucleic acid replication for positive-sense single-stranded RNA viruses:

    1. Positive-sense RNA transcribed to positive-sense RNA
    2. Positive-sense RNA transcribed to negative-sense RNA
    3. Positive-sense RNA transcribed to DNA then to positive-sense RNA
    4. Positive-sense RNA transcribed to DNA then to negative-sense RNA
    5. Positive-sense RNA transcribed to negative-sense RNA then to positive-sense RNA+

5. Mode of viral protein synthesis for negative-sense single-stranded RNA viruses:

1. Negative-sense RNA transcribed to negative-sense RNA then translated to the protein
2. Negative-sense RNA transcribed to positive-sense RNA then translated to the protein+
3. Negative-sense RNA is translated to the protein
4. Negative-sense RNA transcribed to DNA then translated to the protein
5. Negative-sense RNA transcribed to DNA, next into positive-sense RNA and then translated to the protein

6. Suffix for viral family name:

1. -vira
2. -virales
3. –viridae+
4. -virinae
5. -virus

7. The mode of viral replication:

1. Intracellular reproduction+
2. Spore germination
3. Fragmentation
4. Dissociation
5. Binary fission

8. Possible variant of viral symmetry type:

1. Globular symmetry
2. Round symmetry
3. Axial symmetry
4. Helical symmetry+
5. Central symmetry

9. The number of passages the diploid cell cultures can undergo:

1. 1-2
2. 5-10
3. 50-100+
4. 500-1000
5. 1000 and more

10. Method of viral identification:

1. Hemagglutination inhibition test+
2. Inclusion formation
3. Cytopatic effect
4. Hemadsorbtion
5. Hemagglutination test

11. Supercapsid protein:

1. Flagellin
2. Hemagglutinin+
3. RNA polymerase
4. Reverse transcriptase
5. Core protein

12. The essential feature of viruses:

1. Viral envelope is covered with capsule
2. Need cell machinery for replication+
3. Cellular structure
4. Energy gain from biological oxidation
5. Contain both types of nucleic acid

13. The main parameter for modern classification of viruses:

1. Viral size
2. Symmetry type
3. Nucleic acid sequence+
4. Physical and chemical properties
5. Type of natural host

14. Mode of viral nucleic acid replication for negative-sense single-stranded RNA viruses:

1. Negative-sense RNA transcribed to negative-sense RNA
2. Negative-sense RNA transcribed to positive-sense RNA
3. Negative-sense RNA transcribed to DNA then to negative-sense RNA
4. Negative-sense RNA transcribed to positive-sense RNA then to negative-sense RNA+
5. Negative-sense RNA transcribed to DNA then to positive-sense RNA

15. Mode of viral protein synthesis for positive-sense single-stranded RNA viruses:

1. Positive-sense RNA is translated to the protein+
2. Positive-sense RNA transcribed to positive-sense RNA then translated to the protein
3. Positive-sense RNA transcribed to negative-sense RNA then translated to the protein
4. Positive-sense RNA transcribed to DNA then translated to the protein
5. None of above listed

16. Mode of viral nucleic acid replication for retroviruses:

1. Retroviral RNA transcribed to negative-sense RNA
2. Retroviral RNA transcribed to positive-sense RNA
3. Retroviral RNA transcribed to DNA then to RNA+
4. Retroviral positive RNA transcribed to negative-sense RNA then to positive RNA
5. Retroviral ambisense RNA positive fragments are transcribed to negative-sense RNA then to positive RNA

17. Suffix for viral genus name:

1. -vira
2. -virales
3. -viridae
4. -virinae
5. -virus+

18. Impossible variant of human viral infection outcome:

1. Productive infection
2. Latent infection
3. Lysogenic conversion+
4. Persistent infection
5. Cell tumor transformation

19. These subgroups comprise viral structural proteins except:

1. Adress proteins
2. Attachment proteins
3. Fusion proteins
4. Viral enzymes+
5. Capsomer proteins

20. The origin of the cells for continuous cell cultures:

1. Primary skin fibroblast culture
2. Monkey kidney culture
3. Human embryo cells
4. Human malignant cells+
5. Chicken embryo cells

21. Method of viral detection (viral indication):

1. Cytopatic effect neutralization
2. Hemadsorbtion inhibition
3. Hemagglutination inhibition test
4. Complement fixation test
5. Syncytium formation+

22. Method for rapid identification of viruses:

1. Neutralization test
2. PCR+
3. Plaque formation
4. Infection of laboratory animals
5. Chicken embryo inoculation

23. Part of bacteriophage comprising phage nucleic acid:

1. Tail
2. Head+
3. Sheath
4. Fibers
5. Basal plate

24. Phage structure that accounts for specific phage binding to bacterial cell:

1. Fibers+
2. Tail
3. Head
4. Head capsomers
5. Phage nucleic acid

25. The enzyme facilitating phage entry into bacterial cell:

1. Hyaluronidase
2. Protease
3. Lysozyme+
4. Nuclease
5. Phospholipase

26. These stages are present in course of productive phage infection except:

1. Adsorption
2. Cell penetration
3. Lysogeny+
4. Reproduction
5. Phage release (egress)

27. Disjunctive type of phage reproduction means:

1. Phage components are synthesized in separate bacterial cell compartments followed by next virion assembly+
2. Phage replication occurs in special separated cell compartment
3. Sequential (step-by-step) synthesis of phage components
4. Repeated temporary termination of synthesis of phage proteins and nucleic acid
5. Replication of phage nucleic acid precedes the synthesis of viral proteins

28. Phage (or lysogenic) conversion means:

1. Transformation of DNA-containing phages into RNA-containing ones
2. Activation of latent phages
3. Disassembling of phage particle
4. Bacterial cell acquires new features as the result of prophage gene expression+
5. Lysis of bacterial cell by offspring phage particles

29. Prophage is:

1. Parental bacteriophage primarily present in bacterial cell
2. Nucleic acid of temperate phage integrated into bacterial genome+
3. Immature phage
4. Senescent degrading phage particle
5. Dormant phage particle present in bacterial cytoplasm

30. Integration of phage DNA into bacterial chromosome occurs due to:

1. Spontaneous mutations
2. Induced mutagenesis
3. Site-specific recombination of bacterial and viral DNA+
4. Incorrect reparation of bacterial genome
5. Error-prone replication of bacterial DNA

31. Lysogenic conversion can generate:

1. Exotoxin production by bacteria
2. Change of structure of bacterial cell wall
3. Synthesis of invasive enzymes
4. Antibiotic resistance
5. All above mentioned is true+

32. Phage titer in liquid medium test means:

1. Certain tube dilution of bacteriophages
2. Last dilution of phage culture able to cause complete inhibition of bacterial growth in standard experimental conditions+
3. Total count of phage particles
4. Total number of phage plaques
5. Minimal amount of specific antibodies completely inactivating standard number of phages

33. Phagotyping implies:

1. Identification of narrow bacterial population susceptible to highly specific bacteriophages+
2. Accumulation of phage particles in liquid or solid medium
3. Classification of phages according to their properties
4. Identification of bacteria harboring specific phage genome
5. Transduction of bacterial culture

34. Structural properties of orthomyxoviruses:

1. Helical symmetry, rod-shaped
2. Icosahedral symmetry, break-shaped
3. Helical symmetry, spherical shape+
4. Complex symmetry, spherical shape
5. Icosahedral symmetry, rod-shaped

35. Gene drift of influenzaviruses means:

1. Genetic translocations of viral structural genes
2. Point mutations within hemagglutinin and neuraminidase genes+
3. Genetic reassortment of hemagglutinin and neuraminidase gene segments
4. Gene transfer from avian to human host
5. Change of influenzavirus type

36. Influenzavirus type, able to cause pandemics:

1. Type A+
2. Type B
3. Type C
4. Type B and C
5. None of above listed

37. Morbillivirus can cause:

1. Mumps
2. Measles+
3. Acute bronchiolitis
4. Pharyngoconjunctival fever
5. Acute hemorrhagic cystitis

38. Parainfluenza virus cell entry is facilitated by:

1. G-protein
2. M-protein
3. HN glycoprotein+
4. Neuraminidase
5. F-protein

39. Paramyxoviridae representative, able to affect reproductive system:

1. Parainfluenza virus
2. Morbillivirus
3. Respiratory syncytial virus
4. Mumps virus+
5. All above listed

40. Test for respiratory syncytial virus identification:

1. Hemagglutination inhibition test
2. Neutralization of cytopathic effect+
3. Hemadsorbtion inhibition test
4. Hemadsorbtion test
5. Plaque formation

41. Paired sera test is considered to be significant in case of antibodies titer rise:

1. Twofold
2. Fourfold and more+
3. Eightfold and more
4. Tenfold and more
5. There are no established limits

42. Trivalent vaccine for respiratory disease prophylaxis is composed of:

1. Live parainfluenza virus, mumps virus, measles virus
2. Live influenza virus, mumps virus, measles virus
3. Inactivated influenza virus, live mumps virus and measles virus
4. Live rubella virus, influenza virus, measles virus
5. Live rubella virus, mumps virus, measles virus+

43. Most suitable vaccine for respiratory syncytial virus infection prophylaxis:

1. Inactivated vaccine
2. Attenuated live vaccine
3. Subvirion vaccine
4. Subunit vaccine
5. None of above listed+

44. Most efficient method for SARS virus laboratory diagnosis:

1. Cell culture
2. Hemagglutionation inhibition test
3. Infection of laboratory animals
4. PCR+
5. Neutralization of cytopathic effect

45. Genetic event, ensuring the pandemic influenza virus strain appearance:

1. Transduction
2. Gene insertion
3. Gene shift+
4. Gene drift
5. Complementation

46. Paramyxoviridae representatives, which are lack of hemagglutinin activity:

1. Parainfluenza virus
2. Rubulavirus
3. Morbillivirus
4. Mumps virus
5. Respiratory syncytial virus+

47. Genetic shift of influenzaviruses means:

1. Genetic reassortment of hemagglutinin and neuraminidase genes+
2. Influenzavirus genes movement along the host cell chromosome
3. Influenza gene transfer from swine to human hosts
4. Point mutations within hemagglutinin and neuraminidase genes
5. Genetic reassortment of influenzavirus gene, encoding RNA-polymerase

48. Structural properties of paramyxoviruses:

1. Helical symmetry, spherical shape+
2. Icosahedral symmetry, rod-shaped
3. Naked virus, rod-shaped
4. Enveloped virus, icosahedral symmetry
5. Complex symmetry, spherical shape

49. Symplast formation in measles is promoted by:

1. HN glycoprotein
2. M-protein
3. Neuraminidase
4. F-protein+
5. G-protein

50. Rubulavirus can cause:

1. Epidemic keratoconjunctivitis
2. Mumps+
3. Measles
4. Pharingoconjunctival fever
5. None of above listed

51. Express-method of influenza laboratory diagnosis:

1. Hemagglutination test
2. Hemagglutination inhibition test
3. Complement fixation test
4. Neutralization of chicken embryo death
5. Immunofluorescent test+

52. Test for parainfluenza virus identification:

1. Hemadsorbtion inhibition test+
2. Hemagglutination test
3. Hemadsorbtion test
4. Inclusion formation
5. Cytopathic effect detection

53. Viral disease that is successfully managed by specific prophylaxis:

1. Adenoviral infection
2. Measles+
3. Parainfluenza
4. Coronaviral infection
5. Respiratory syncytial infection

54. Vaccine for mumps prophylaxis:

1. Inactivated vaccine
2. Attenuated live vaccine+
3. Subvirion vaccine
4. Subunit vaccine
5. Recombinant vaccine

55. Influenza virus strain with highest pathogenic potential:

1. H_1N_1
2. H_1N_1 "swine flu"
3. H_5N_1+
4. H_3N_2
5. H_2N_2

56. Structural properties of picornaviruses:

1. Single-stranded DNA naked virus
2. Double-stranded DNA enveloped virus
3. Positive-sense RNA naked virus+
4. Negative-sense RNA enveloped virus
5. Positive-sense RNA enveloped virus

57. Structural properties of rotaviruses:

1. Double-stranded DNA naked virus
2. Diploid positive RNA enveloped virus
3. Ambisense segmented single-stranded RNA enveloped virus
4. Double-stranded RNA-segmented naked virus with 2 capsids+
5. Positive-sense RNA naked virus

58. Representative of picornaviruses, causing foot-and-mouth disease:

1. Enterovirus
2. Parechovirus
3. Rhinovirus
4. Cardiovirus
5. Aphthovirus+

59. Most resistant virus from the below listed:

1. Measles virus
2. Poliovirus+
3. Influenzavirus
4. Parainfluenzavirus
5. Mumps virus

60. Picornaviral infection that is successfully controlled by specific prophylaxis:

1. Poliomyelitis+
2. Coxsackie infection
3. Echoviral infection
4. Rhinoviral infection
5. None of above listed

61. These methods are used for Coxsackie infection diagnosis except:

1. Inoculation of virus-containing material into tissue cultures
2. Inoculation of virus-containing material into suckling mice
3. ELISA
4. Inoculation of virus-containing material into cell-free medium+
5. Hemagglutination inhibition test

62. Most common form of poliomyelitis:

1. Abortive poliomyelitis+
2. Non-paralytic poliomyelitis
3. Aseptic meningitis
4. Paralytic poliomyelitis
5. Herpangina

63. Method that is not used for poliomyelitis laboratory diagnosis:

1. Hemagglutination test+
2. Cell line cultivation
3. Cytopathic effect determination
4. Serologic testing
5. Neutralization reaction

64. Below listed diseases are caused by Coxsackie virus except:

1. Epidemic myalgia
2. Aseptic meningitis
3. Pharyngoconjunctival fever+
4. Herpangina
5. Myocarditis

65. The most severe adenoviral infection of early postnatal period:

1. Adenoviral gastroenteritis
2. Adenoviral pneumonia+
3. Acute hemorrhagic cystitis
4. Acute febrile pharyngitis
5. Epidemic keratoconjunctivitis

66. The major causative agents of infant's gastroenteritis

1. Enteroviruses types 68-71
2. Echoviruses
3. Parechoviruses
4. Coxsackie viruses
5. Rotaviruses+

67. Structural properties of adenoviruses:

1. Double-stranded DNA naked virus+
2. Double-stranded DNA enveloped virus
3. Positive-sense RNA naked virus
4. Negative-sense RNA enveloped virus
5. Positive-sense RNA enveloped virus

68. Rotaviruses pertain to:

1. Enteroviruses
2. Reoviruses+
3. Rhinoviruses
4. Echoviruses
5. Parechoviruses

69. The virus capable of producing enterotoxin:

1. Enterovirus
2. Adenovirus
3. Rotavirus+
4. Echoviruses
5. Hepatitis A virus

70. "Swimming pool conjunctivitis" is caused by:

1. Coxsackie virus group A
2. Coxsackie virus group B
3. Adenovirus+
4. Rotavirus
5. Rhinovirus

71. Main cellular targets for polioviruses

1. Striated muscular cells
2. Epithelial cells
3. Glial cells
4. Spinal cord motoneurons+
5. Axons of peripheral nerves

72. Antibodies of IgG and IgA classes against polioviruses are present in most of human population because of:

1. Broad spread of sub-clinical infection
2. Viral latency (intestinal viral carriage)
3. Viral persistence within immune system
4. Previous immunization with live vaccine+
5. Previous immunization with inactivated vaccine

73. The virus – candidate for global elimination in nearest future:

1. Hepatovirus
2. Enterovirus serotype 70
3. Adenovirus serotype 21
4. Rotavirus
5. Poliovirus+

74. Clinical specimen for poliovirus detection should be taken from:

1. Rectal swab or stool specimen
2. Urine
3. Nasopharingeal swab
4. Nasopharingeal swab and stool specimen+
5. Blood

75. Viral agents that predominantly affect inner organs:

1. Rotaviruses
2. Polioviruses
3. Coxsackie viruses of group A
4. Coxsackie viruses of group B+
5. Echoviruses

76. Basic treatment of rotaviral infection:

1. Restoring of water and electrolyte balance with compensatory infusion therapy+
2. Administration of anti-viral drugs
3. Antibiotic treatment
4. Intravenous immunoglobulin administration
5. Urgent vaccination

77. Vaccine for prophylaxis of major forms of Coxsackie infection:

1. Live attenuated
2. Inactivated vaccine
3. Genetically engineered
4. Sub-virion vaccine
5. None of above listed, vaccine remains unavailable yet+

78. Primary laboratory test for serological diagnosis of HIV infection:

1. Latex agglutination
2. RT-PCR
3. Immunoblotting
4. Radioimmunoassay
5. ELISA+

79. The disease with highest rate of transmission to susceptible persons after medical manipulations:

1. HIV infection
2. Hepatitis A
3. Hepatitis B+
4. Deltaviral infection
5. Hepatitis C and HIV mixed infection

80. Immune cells that store and disseminate HIV:

1. T-helper CD4(+) cells
2. B-cells
3. Neutrophils
4. Macrophages and monocytes+
5. Cytotoxic CD8(+) T-cells

81. Hepatitis with the longest incubation period:

1. Hepatitis A
2. Hepatitis B+
3. Hepatitis C
4. Hepatitis D
5. Hepatitis E

82. Causative agent that induces the most severe fulminant hepatitis:

1. Deltavirus+
2. Hepatovirus
3. Hepadnavirus
4. Hepacivirus
5. Hepevirus

83. Hepatites transmitted predominantly by fecal-to-oral route:

1. Hepatitis A, Hepatitis B
2. Hepatitis A, Hepatitis C, Hepatitis B
3. Hepatitis A, Hepatitis B, Hepatitis E
4. Hepatitis A, Hepatitis B, Hepatitis D
5. Hepatitis A, Hepatitis E+

84. Hepatitis virus capable of integrating its DNA into hepatic cell genome:

1. Hepatovirus
2. Hepadnavirus+
3. Deltavirus
4. Hepacivirus
5. Hepevirus

85. Efficient vaccine for hepatitis A prophylaxis:

1. Vaccine is absent
2. Inactivated vaccine+
3. Attenuated live vaccine
4. Recombinant vaccine
5. Subunit peptide vaccine

86. Highly active antiretroviral therapy includes:

1. Treatment with reverse transcriptase inhibitors
2. Combination of reverse transcriptase inhibitors and viral integrase inhibitors
3. Combination of reverse transcriptase inhibitors and immunostimulatory drugs
4. Combination of reverse transcriptase inhibitors and viral protease inhibitors+
5. Combination of nucleoside and non-nucleoside reverse transcriptase inhibitors

87. Cytokine, stimulating HIV replication:

1. IL-2
2. IL-4
3. IL-8
4. Beta-interferon
5. TNF-alpha+

88. Hepatic disease devoid of specific vaccination:

1. Hepatitis A
2. Hepatitis B
3. Hepatitis C+
4. Delta infection
5. Co-infection with Hepatitis B and delta viruses

89. Confirmatory test for HIV infection diagnosis:

1. Southern blotting
2. Northern blotting
3. Western blotting+
4. Eastern blotting
5. Reverse transcriptase PCR

90. Successful penetration of HIV into susceptible cell is achieved via:

1. Cellullar CD1 antigen
2. Cellullar adrenoreceptors, associated with G proteins
3. Cellullar CD8 antigen and TNF receptor
4. Cellullar CD4 antigen and CXCR4 or CCR5+
5. Cellullar CD4 antigen and GM CSF receptor

91. HIV infection is contracted via the following routs of transmission except:

1. Intravenous drug use
2. Vertical rout
3. Contact rout (contact with patient's saliva)+
4. Contact rout (sexual intercourse)
5. Artificial rout

92. Critical blood levels of T helper cells resulting in AIDS development:

1. Number of T helper cells is in the range of 1000-1500 cells per 1 microliter (ul)
2. Less than 1000 cells but more than 500 cells per 1 ul
3. 200-500 T helper cells per 1 ul
4. Less than 200 cells per 1 ul+
5. Less than 100 cells per 1 ul

93. Hepatitis, caused by *Picornaviridae* representative:

1. Hepatitis A+
2. Hepatitis B
3. Hepatitis C
4. Hepatitis D
5. Hepatitis E

94. First clinical manifestations in HIV infection:

1. Persistent generalized lymphoadenopathy
2. Acute mononucleosis-like syndrome+
3. Cytomegalovirus infection
4. Varicella-zoster
5. Mycobacterial infections

95. Most resistant causative agent of viral hepatitis:

1. Hepatovirus
2. Deltavirus
3. Hepacivirus
4. Hepadnavirus+
5. Hepevirus

96. Hepatites, which can be transmitted by artificial route:

1. Hepatitis C, Hepatitis B
2. Hepatitis C, Hepatitis B, Hepatitis E
3. Hepatitis A, Hepatitis E
4. Hepatitis A, Hepatitis B, Hepatitis D
5. Hepatitis C, Hepatitis D, Hepatitis B+

97. Hepatitis virus, showing greatest genetic diversity:

1. Hepatitis A virus
2. Hepatitis B virus
3. Hepatitis C virus+
4. Hepatitis D virus
5. Hepatitis E virus

98. Vaccine for hepatitis B prophylaxis:

1. Recombinant vaccine+
2. Subvirion vaccine with adjuvant
3. Subunit vaccine
4. Inactivated vaccine
5. Attenuated live vaccine

99. Most successful method for hepatitis C treatment:

1. Administration of reverse transcriptase inhibitors
2. Ribavirin treatment
3. Recombinant IL-2 treatment
4. Recombinant alpha-interferon treatment
5. Combined therapy with ribavirin and recombinant prolonged PEG-interferon+

100. Type 3 herpesvirus:

1. Simplex virus
2. Varicella/zoster herpesvirus+
3. Cytomegalovirus
4. Epstein-Barr virus
5. Roseolovirus

101. Structural properties of lyssavirus:

1. Negative-sense RNA enveloped virus+
2. Positive-sense RNA naked virus
3. Diploid RNA enveloped virus
4. Positive-sense RNA enveloped virus
5. Double-stranded DNA enveloped virus

102. *Betaherpesvirinae* representative:

1. Epstein-Barr virus
2. Varicellovirus
3. Herpes simplex virus
4. Herpesvirus of type 8
5. Cytomegalovirus+

103. Animals, able to store viable rabies virus:

1. Ferrets
2. Raccoons
3. Foxes
4. Vampire bats+
5. Dogs

104. Drug for successful herpes simplex infection treatment:

1. Indinavir
2. Saquinavir
3. Acyclovir+
4. Ribavirin
5. Lamivudin

105. Inclusions in lyssavirus-infected cells:

1. Elementary bodies
2. Reticulate bodies
3. Guarnieri bodies
4. Babes-Negri bodies+
5. Paschen's bodies

106. Most serious rubella complication:

1. Arthritis development
2. Congenital rubella syndrome+
3. Lymphoadenopathy
4. Aseptic meningitis
5. Secondary immunodeficiency

107. Structural properties of herpesviruses:

1. Positive-sense RNA naked virus
2. Negative-sense RNA enveloped virus
3. Diploid RNA enveloped virus
4. Positive-sense RNA enveloped virus
5. Double-stranded DNA enveloped virus+

108. Rabies treatment in case of animal multiple bites into head and upper extremities:

1. Specific vaccination
2. Anti-rabies immunoglobulin treatment
3. Anti-rabies immunoglobulin treatment combined with vaccination+
4. Specific vaccination combined with interferon treatment
5. Anti-rabies immunoglobulin administration combined with antibiotic treatment

109. Vaccine for rubella prophylaxis:

1. Attenuated live vaccine+
2. Inactivated vaccine
3. Subvirion vaccine with adjuvant
4. DNA vaccine
5. Recombinant vaccine

110. The virus that exerts specific tumor in AIDS patients

1. Herpesvirus of type 8+
2. Herpesvirus of type 6
3. Herpesvirus of type 2
4. Epstein-Barr virus
5. Cytomegalovirus

111. Structural properties of rubella virus:

1. Positive-sense RNA naked virus
2. Negative-sense RNA enveloped virus
3. Circular single-stranded DNA enveloped virus
4. Positive-sense RNA enveloped virus+
5. Double-stranded DNA enveloped virus

112. *Gammaherpesvirinae* representative:

1. Cytomegalovirus
2. Epstein-Barr virus+
3. Varicellovirus
4. Herpes simplex virus
5. Herpesvirus of type 6

113. Structural properties of roseoloviruses:

1. Positive-sense RNA enveloped virus
2. Negative-sense RNA enveloped virus
3. Double-stranded DNA enveloped virus+
4. Circular double-stranded DNA enveloped virus
5. Double-stranded DNA naked virus

114. Herpesvirus transmitted predominantly by sexual intercourse:

1. Herpesvirus of type 1
2. Herpesvirus of type 2+
3. Herpesvirus of type 3
4. Herpesvirus of type 4
5. Herpesvirus of type 5

115. The virus that cause congenital abnormalities:

1. Rhabdovirus
2. Cytomegalovirus+
3. Varicellovirus
4. Herpesvirus of type 8
5. Epstein-Barr virus

116. Mortality rate in manifested rabies:

1. Less than 20%
2. 20-50%
3. 50-70%
4. 100%+
5. Less than 20% if treated

117. The way rabies virus spreads from primary lesion:

1. By blood
2. By lymph
3. Within immune cells
4. Via peripheral nerves+
5. All above listed

118. Viral entry of Epstein-Barr virus into B cells occurs via:

1. CD19
2. CD20
3. CD21+
4. CD5
5. CD40

119. Predominant site of persistency of herpesvirus type 2:

1. Urogenital epithelium
2. Intestinal epithelium
3. Lymph nodes
4. Brain
5. Sacral ganglia+

120. The virus – potential agent of carcinogenesis:

1. Rubella virus
2. Epstein-Barr virus+
3. Herpes simplex virus
4. Herpes zoster virus
5. Lyssavirus

121. Herpesvirus type 8 can cause:

1. Burkitt's lymphoma
2. Nasopharyngeal carcinoma
3. Kaposi's sarcoma+
4. Hodgkin's disease
5. T cell leukemia

122. Infectious agent in prion diseases:

1. Intracellular bacteria
2. DNA-containing virus
3. RNA-containing virus
4. Abnormal protein+
5. Abnormal lipid

123. Molecular origin of prion diseases:

1. Overproduction of PrP^{C} proteins
2. Expression of PrP^{Sc} proteins; the latter spread their altered conformation towards normal PrP^{C} proteins+
3. Enhanced expression of PRNP gene
4. Dampening of intracellular proteasome activity
5. Self-aggregation of serum amyloid

124. Primary tissues and organs affected in prion diseases:

1. Cardiovascular system
2. Central nervous system+
3. Lymphoid tissue
4. Connective tissue
5. Parenchymatous organs

125. Prion disorders are characterized by following histopathological changes:

1. Spongiform degeneration and atrophy, amyloid plaques+
2. Multifocal sclerosis
3. Vasculitis and microhemorrhages
4. Systemic inflammation
5. Tissue edema

126. Acquired form of prion disease:

1. Gerstmann-Straussler-Scheinker syndrome
2. Sporadic form of Creutzfeldt-Jakob disease
3. "New variant" of Creutzfeldt-Jakob disease+
4. Fatal familial insomnia
5. Alpers syndrome

127. Contraction of kuru disease:

1. Water-born
2. Air-born
3. Vector-transmitted disease
4. Contact rout of transmission
5. Results from ritual cannibalism+

128. Prion disease characterized by sleeplessness, mental disorders, and endocrine dysfunction:

1. Kuru disease
2. Sporadic form of Creutzfeldt-Jakob disease
3. "New variant" of Creutzfeldt-Jakob disease
4. Fatal familial insomnia+
5. Gerstmann-Straussler-Scheinker syndrome

129. Human prion disease transmitted by alimentary route with infected beef:

1. Fatal familial insomnia
2. Gerstmann-Straussler-Scheinker syndrome
3. Kuru disease
4. Alpers syndrome
5. "New variant" of Creutzfeldt-Jakob disease+

130. The ailment with suspected prion origin:

1. Schizophrenia
2. Sub-acute sclerosing panencephalitis
3. Senile dementia
4. Alzheimer's disease+
5. Chronic fatigue syndrome

131. Diagnosis of prion diseases is based on:

1. PCR
2. Molecular hybridization
3. Cytological examination of brain tissue on autopsy+
4. Cell culture testing
5. Neutralization test

132. Treatment of prion diseases is performed with:

1. Proteases
2. Anti-toxic antibodies
3. Antibiotics
4. Anti-viral drugs
5. None of above listed, anti-prion drugs are not elaborated yet+

133. These measures are used for prevention of acquired prion diseases except:

1. Vaccination+
2. Careful selection of donor's tissues for transplantation
3. Tight control of medical sterilization
4. Burning of the carcasses of dead animals
5. Thorough veterinary surveillance

LIST OF CORRECT ANSWERS

General Microbiology

№	ANSWER
1	3
2	5
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Medical Immunology & Infection

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Medical Virology

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для студентов высших медицинских учебных заведений

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