Microbiology and immunology

List of topics for pharmacy students

Academic year 2018/2019.

1. Structure, shape and size of bacteria
2. Prokaryotic cell wall
3. Capsule, endospore and flagella
4. Bacterial growth, cultivation of bacteria
5. Structure of bacterial genom, other genetic elements in bacterial cells (plasmid, phage, transposons). Gene transfer in bacteria
6. Principle and practice of sterilization
7. Principle and practice of disinfection
8. Factory hygiene and the principle of good manufacturing practice
9. Microbiological requirements and purity classes of pharmaceutical products
10. Sterility testing of pharmaceuticals
11. Contamination and microbiological spoilage of pharmaceutical products. Preservation and preservatives.
12. Pharmaceutical biotechnology, pharmaceutics produced by microorganisms
13. Production of pharmaceutics by gene technology and their application
14. Antibiotics acting through the inhibition of bacterial cell wall synthesis
15. Antibiotics acting through the inhibition of bacterial protein synthesis
16. Antibiotics acting through the inhibition of bacterial nucleic acid synthesis
17. Chemotherapy of infections by mycobacteria
18. Resistance of bacteria to antimicrobial drugs. Development and mechanisms of resistance
19. Principles of microbiological evaluation of antibiotics
20. General principles of antibacterial chemotherapy. Selective toxicity, therapeutic index
21. Antimicrobial drug interactions. Side effects. Antibiotic policy
22. Pathogenicity and virulence of microorganisms. Measurement of virulence. Attenuation and enhancement of virulence, non toxic virulence-factors
23. Exotoxins and endotoxins
24. Immunbiological products. Manufacturing and quality control, vaccine safety
25. Molecular methods in the diagnostic microbiology
26. The cultivation and cultivation based methods

27. Organs and cell types of the immune system
28. Innate immunity. Phagocytosis, phagocytic cells
29. Structure of BCRs and immunoglobulins
30. The structure and function of T-cell receptors
31. Structure and function of MHC molecules
32. Cytokines of the innate immune system, proinflammatory cytokines
33. Cytokines involved in the differentiation and activation of lymphocytes
34. Hemopoetic cytokines and growth factors
35. Cytokine receptors and their signaling pathways

36. Maturation and activation of B cells
37. Maturation and activation of T-lymphocytes
38. Characteristics of humoral immune response elicited by the types of T-cell independent antigens.
39. Characteristics of humoral immune response elicited by the types of T-cell dependent antigens.
40. The process of endogenous and exogenous antigen presentation.
41. The effector functions of immunoglobulins, humoral immune response
42. The elements of the complement system, the classical pathway of complement activation
43. Alternative complement-activation pathway and activation induced by lectins.
44. The biological importance of complement activation and the regulation of complement system.
45. Type I. and II. hypersensitivity reactions
46. Type III. and IV. hypersensitivity reactions
47. Vaccines
48. Passive immunization

49. Staphylococci
50. *Streptococcus pyogenes*
51. *Streptococcus pneumoniae,* Gram staining
52. *Streptococcus agalactiae,* anaerobic streptococci, enterococci
53. *Neisseria gonorrhoeae, Neisseria meningitidis*
54. *Corynebacterium diphtheriae, Listeria monocytogenes,* Neisser staining
55. *Bacillus anthracis, Bacillus cereus*
56. *Clostridium tetani, Clostridium botulinum*
57. *Clostridium perfringens, Clostridium difficile,* Schaffer-Foulton staining
58. *Escherichia coli, Yersinia enterocolitica*
59. Salmonella, Shigella, *Vibrio cholerae*
60. Campylobacter, Helicobacter
61. Pseudomonas, Proteus, Bacteroides
62. *Haemophilus influenzae, Legionella pneumophila, Bordetella pertussis*
63. Mycobacteria (*Mycobacterium tuberculosis, Mycobacterium leprae),* Ziehl-Neelsen staining
64. Spirochaetes (Treponema)
65. Borrelia, Leptospira
66. Chlamydia, Rickettsia

67. General properties and structure of viruses. Chemical composition of viruses. Nomenclature and classification of viruses
68. Biosynthesis of viruses. The effect of virus replication on host cells
69. Viral chemotherapy
70. Adenoviruses
71. Human herpesvirus type 1, 2 and 3
72. Human herpesvirus type 5, 6 and 7
73. Human herpesvirus type 4 and 8

74. Human papillomaviruses
75. Parvovirus B19
76. Rotavirus, Calicivirus
77. Flaviviruses (yellow fever virus, spring-summer tickborn encephalitis virus, West-Nile virus)
78. Orthomyxoviruses
79. Paramyxoviruses (parainfluenza virus, mumps virus, morbilli virus, RS virus)
80. Poliovirus
81. Coxsackie-viruses, echoviruses, enteroviruses
82. Rhinovirus, coronavirus
83. Retroviruses (HIV, HTLV)
84. Pathomechanism of AIDS, clinical symptoms, therapy and epidemiology
85. Rabies virus
86. Rubella virus
87. Hepatitis viruses (A, E, G)
88. Hepatitis viruses (B, C, D)
89. Slow virus infections

90. General properties of fungi
91. Dermatomycoses
92. Superficial and subcutaneous mycoses
93. Systemic mycoses
94. Opportunistic mycoses
95. Antifungal therapy, laboratory diagnosis of fungal diseases
96. General properties of protozoa, therapy of protozoal infections.
97. Entamoeba, *Giardia lamblia, Trichomonas vaginalis*
98. Amoeba, Trypanosoma, *Toxoplasma gondii*
99. Leishmania, Malaria
100. General properties of helminthes, therapy of helminth infections
101. *Enterobius vermicularis, Trichuris trichiura, Ascaris lumbricoides*
102. *Ancylostoma duodenale, Trichinella spiralis,*
103. Taenia, Echinococci