

Questions of medical microbiology – actual, valid for autumn semester 2015/16

Practical tasks are not published for students, it is necessary to learn the topics of both semesters (including understanding the principles of tasks).

General microbiology

1. Morphology of bacteria, composition of a bacterial cell
2. Bacterial metabolism
3. Microorganisms and environment, growth and multiplication of bacteria, cultivation of bacteria
4. Bacterial genetics
5. Course, form and outcome of an infection
6. Forms and mechanisms of transmission and spreading of infections
7. Pathogenicity and virulence
8. Invasivity factors
9. Ability of microorganisms to break through host defence mechanisms
10. Microbial toxicity
11. Damage as result of host defence reactions
12. Antiinfective immunity – survey, microbial antigens
13. Principles and mechanisms of specific (acquired) antimicrobial immunity – cell mediated
14. Principles and mechanisms of specific (acquired) antimicrobial immunity – humoral (antibodies and their production and importance)
15. Principles and mechanisms of non-specific (innate) antimicrobial immunity – humoral components, barriers against colonisation and invasion of microbes
16. Principles and mechanisms of non-specific (innate) antimicrobial immunity – cell components, phagocytosis
17. Serology reactions – principles, interpretation of results
18. Normal human microbial flora – composition and importance (resident and transient flora)
19. Nature and classification of viruses, virion structure, viral genetics
20. Multiplication of viruses. Influence of viral infection on a cell
21. Course, forms and pathogenesis of viral infections
22. Viruses and environment, inactivation of viruses
23. Host protection against viral infections
24. General properties of fungi and their pathogenicity
25. Basic terms of parasitology, differences from other branches of microbiology

Antimicrobial therapy

1. Survey and practical use of disinfection, multi-step disinfection and higher step disinfection
2. Survey and practical use of sterilization, use of bioindicators
3. Effects of antimicrobial drugs on microbes
4. Undesirable effects of antibiotics
5. Resistance of microbes to antimicrobial drugs and antimicrobial susceptibility testing
6. Clinically important resistances (MRSA, MLS, VRE, betalactamases and karbapenemases) and their detection
7. Antibiotic and non-antibiotic treatment of biofilm infections, control of effectivity of such a treatment
8. Basic principles of antimicrobial therapy – choice of antibiotics
9. Antibiotic centre, rational antibiotic therapy and prophylaxis
10. Penicillins
11. Cephalosporins
12. Monobactams and karbapenems
13. Tetracyclines, glycyliclones and chloramphenicol
14. Aminoglykosides

15. Macrolids and azalids
16. Linkosamides, streptogramins, oxazolidinons
17. Glykopeptides, (lipoglykopeptids), polypeptides and ansamycins
18. Quinolones and fluoroquinolones
19. Other antibacterial chemoterapeutics – antagonists of folic acid, nitrofurans, nitroimidazoles
20. Antituberculotics, basic principles of therapy of mycobacterial infections
21. Antimycotics for both topical and general therapy
22. Prevention, prophylaxis of viral infections
23. Antivirotics
24. Antiparasital drugs
25. Artificial active immunisation – principle, types of vaccines, practical use (regular and other vaccines)
26. Regular vaccination compulsory and voluntary, vaccination and chemoprophylaxis when travelling abroad
27. Artificial passive immunisation

Aetiology

1. Aetiology and laboratory diagnostics of sepsis
2. Aetiology and laboratory diagnostics of infectious endocarditis
3. Aetiology and laboratory diagnostics of infections related to the presence of implants and biofilm formation (including catheter sepsis)
4. Aetiology and laboratory diagnostics of rhinitis, sinusitis and middle ear infections
5. Aetiology and laboratory diagnostics of tonsillitis, pharyngitis and tonsilopharyngitis
6. Aetiology and laboratory diagnostics of respiratory infections – laryngitis, epiglottitis, tracheitis
7. Aetiology and laboratory diagnostics of eye infections
8. Aetiology and laboratory diagnostics of lower respiratory tract infections and lungs – bronchitis, community acquired pneumonia
9. Aetiology and laboratory diagnostics of lower respiratory tract infections and lungs – nosocomial pneumonia and subacute or chronic lung infections
10. Aetiology and laboratory diagnostics of infections of oral cavity and oesophagus infections and gastric diseases with partially microbial aetiology
11. Aetiology and laboratory diagnostics of intestinal infections
12. Aetiology and laboratory diagnostics of enterotoxicooses
13. Aetiology and laboratory diagnostics of bile ways and liver infections
14. Aetiology and laboratory diagnostics of purulent meningitis
15. Aetiology and laboratory diagnostics of CNS infections and otitis interna (except purulent meningitis)
16. Aetiology and laboratory diagnostics of UTI
17. Aetiology and laboratory diagnostics of classical sexually transmitted infections
18. Aetiology and laboratory diagnostics of infections of reproductive organs other than classical STIs
19. Aetiology and laboratory diagnostics of infections of wounds and soft tissues
20. Aetiology and laboratory diagnostics of infections of bones and joints
21. Aetiology and laboratory diagnostics of bacterial skin and external ear infections
22. Aetiology and laboratory diagnostics of skin mycoses
23. Aetiology and laboratory diagnostics of viral and parasital infections with skin symptoms
24. Aetiology and laboratory diagnostics of congenital and neonatal infections and infections of mother and child after delivery
25. Aetiology of infection of immunocompromised patients
26. Aetiology of nosocomial infections

Special bacteriology (biology, pathogenesis, clinical description of infection, prevention, diagnostics, therapy)

1. Genus *Pseudomonas*
2. Other Gram-negative non-fermenters (especially genera *Burkholderia*, *Stenotrophomonas*, *Acinetobacter*)
3. Genus *Bordetella*
4. Genera *Brucella* and *Francisella*
5. Genus *Legionella*
6. Genus *Campylobacter*
7. Genus *Helicobacter*
8. Characteristics, medical importance and laboratory diagnostics of infections of family *Enterobacteriaceae*
9. Genus *Yersinia*
10. Genus *Salmonella*
11. Genus *Shigella*
12. Genus *Escherichia*
13. Conditionally pathogenic enterobacteria other than *Escherichia*
14. Genus *Vibrio*
15. Genera *Pasteurella*, *Aeromonas* and *Plesiomonas*
16. Genus *Haemophilus*
17. *Neisseria gonorrhoeae*
18. *Neisseria meningitidis*
19. Oral neisseriae, genera *Moraxella*, *Actinobacillus*, *Eikenella*, *Kingella*
20. *Staphylococcus aureus*
21. Coagulase-negative staphylococci
22. *Streptococcus pyogenes*, late (sterile) sequels of streptococcal infections
23. *Streptococcus agalactiae* and other beta-haemolytic streptococci
24. *Streptococcus pneumoniae*
25. Viridans streptococci (except *S. pneumoniae*)
26. Genus *Enterococcus*
27. Genus *Bacillus*
28. Genera *Listeria* and *Erysipelothrix*
29. Genera *Lactobacillus* and *Bifidobacterium*
30. Genus *Corynebacterium* and *Arcanobacterium*
31. Genera *Nocardia*, *Rhodococcus* and *Rothia*
32. *Clostridium botulinum*, *Clostridium tetani*
33. *Clostridium difficile*
34. Anaerobic traumatose clostridia
35. Spore non-forming gram-positive and gram-negative anaerobes
36. Genera *Actinomyces*, *Propionibacterium*
37. Mycobacteria causing tuberculosis
38. *Mycobacterium leprae* and so called atypical mycobacteria
39. Genera *Mycoplasma* and *Ureaplasma*
40. Genera *Chlamydia* and *Chlamydophila*
41. Genera *Rickettsia* and *Orientia*
42. Genera *Anaplasma* and *Ehrlichia*
43. Genus *Bartonella* and *Coxiella burnetii*
44. *Borrelia burgdorferi* sensu lato
45. Genus *Borrelia* – causative agents of relapsing fevers and other borrelias (other than *B. burgdorferi* sensu lato)

46. Genus *Treponema*
47. Genus *Leptospira*

Special mycology

1. Mycotoxins
2. Genus *Candida*
3. Genus *Cryptococcus* and other yeast genera except *Candida*
4. Genera *Pneumocystis* and *Microsporidium*
5. Dimorph micromycets (especially *Histoplasma*, *Coccidioides*, *Paracoccidioides*, *Blastomyces*, *Penicillium marneffei*)
6. Filamentous micromycets – hyaline and pigmented (except zygomycets and dermatophytes), aspergillosis
7. Zygomycets
8. Dermatophytes
9. Pathogenous algae and cyanobacteria

Special virology

1. Genus *Enterovirus* (except polioviruses)
2. Polioviruses
3. Viruses of hepatitis A and E
4. Reoviruses (especially genus *Rotavirus*), kaliciviruses and astroviruses
5. Genus *Rhinovirus* and *Coronavirus*
6. Genus *Alphavirus*. Arboviruses
7. Genus *Rubivirus*
8. Genus *Flavivirus* (except viruses of tick-borne encephalitis)
9. Viruses of tick-borne encephalitis (including louping ill and russian spring-summer encephalitis)
10. Genus *Hepacivirus* – HCV
11. Retroviruses and virus of human immunodeficiency
12. Orthomyxoviruses
13. Genera *Respirovirus* and *Pneumovirus*
14. Genus *Rubulavirus*
15. Genus *Morbillivirus*
16. Genus *Lyssavirus*
17. Bynyaviruses, arenaviruses and filoviruses
18. Genus *Erythrovirus*
19. Human papillomaviruses, polyomaviruses
20. Adenoviruses
21. Genus *Simplexvirus*
22. Genus *Varicellovirus*
23. Genus *Cytomegalovirus* and other herpetic viruses (HHV 6, 7, 8)
24. Genus *Lymphocryptovirus*
25. Genus *Orthohepadnavirus* and hepatitis D virus
26. Poxviruses
27. Prionic agents
28. Importance of bacteriophages in medicine

Parasitology

1. Genus *Trypanosoma*
2. Genus *Leishmania*
3. Medically important amoebae
4. *Gairdia (Lambliia) intestinalis*; *Trichomonas vaginalis*
5. Intestinal coccidias. *Balantidium coli*
6. *Toxoplasma gondii*
7. Genera *Plasmodium* and *Babesia*
8. Medically important flukes
9. *Taenia saginata*, *Taenia solium*
10. Medically important tapeworms other than *Teaenia* (both intestinal and tissue tapeworms)
11. *Enterobius vermicularis*
12. *Ascaris lumbricoides*, Genus *Toxocara*
13. Other intestinal nematodes (*Strongyloides stercoralis*, *Trichuris trichiura*, *Ancylostoma duodenale* and *Necator americanus*)
14. *Trichinella spiralis*, *Dracunculus medinensis*, survey of filariae
15. Medically important acarids
16. Medically important insects and annelidans

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