

General Medicine
Medical Microbiology - 3rd year students
Semi-final exam questions 2018-2019

General bacteriology, pathogenicity

1. Significance, sub-fields and short history of medical microbiology
2. Comparison of pro-and eukaryotic cells
3. System of classification (taxonomy) of bacteria
4. Obligate structures of the bacterial cells
5. Facultative structures of the bacterial cells
6. Structure of the bacterial cell wall and description of the peptidoglycan layer
7. Bacterial metabolism
8. Bacterial genetics: mutation, reversion and modes of gene transfer
9. Sterilisation: theoretical background and practical approaches
10. Disinfection: theoretical background and practical approaches
11. Selective toxicity and the chemotherapeutic index and principles of antibacterial chemotherapy
12. Antimicrobial drugs in combination
13. Chemoprophylaxis: definition, examples
14. Risks and side effects of antimicrobial drugs
15. Antibiotics altering the cell wall synthesis of bacteria: penicillin, cephalosporin
16. Antibiotics altering the cell wall synthesis of bacteria: monobactam, carbapenem, bacitracin
17. Antibiotics altering the protein synthesis of bacteria: aminoglycosides, tetracycline
18. Antibiotics altering the protein synthesis of bacteria: chloramphenicol, macrolide, lincosamides
19. Glycopeptides and antimicrobial drugs altering the membrane functions
20. Antimicrobial drugs altering the DNA and RNA synthesis of bacteria
21. Antituberculous drugs
22. Possible mechanisms of resistance against antibiotics (examples)
23. The Koch's postulates. Pathogenicity, virulence. Determination of virulence
24. Exotoxins: characterisation, types. Bacterial super-antigens and associated syndromes
25. Endotoxin: characterisation, mode of action
26. Non-toxic virulence factors of bacteria
27. Infection: definition, source, portal of entry, transmission routes, and possible outcome
28. Pathomechanism of infection: adhesion, penetration, invasion, dissemination; bacteraemia and toxæmia
29. Active immunisation. Obligatory vaccines for prevention of bacterial infections
30. Non obligatory vaccines for prevention of bacterial infections
31. Passive immunisation. Preparations for the prevention and treatment of bacterial infections
32. Pathomechanism of infection: molecular mimicry and masking; antigen-shift; immunosuppression. Immunomodulant and immunosuppressive effects of microbes (examples)
33. Normal flora of the human body and its significance
34. Pathomechanism of sepsis and its diagnosis
35. Bacterial growth: Growth curve and description of the phases
36. Nosocomial and iatrogenic infections caused by bacteria

Systematic bacteriology

(Taxonomy (classification), morphology, virulence factors, diseases, microbiological diagnosis, treatment and prevention of the associated diseases)

1. *Staphylococcus aureus*
2. Coagulase negative staphylococci
3. *S. pneumoniae*, oral streptococci and cariogenesis
4. *Streptococcus pyogenes*
5. *Streptococcus agalactiae*, *Enterococcus* genus
6. Anaerobic Gram-negative rods (*Bacteroides*, *Fusobacterium*, *Prevotella*, *Porphyromonas*) and associated infections
7. *N. meningitidis*, and apathogenic *Neisseria* species
8. *N. gonorrhoeae* and *Moraxella*
9. *Bacillus anthracis* and other bacilli
10. *Escherichia coli* and the associated intestinal and extraintestinal infections
11. *Klebsiella*, *Serratia*, *Enterobacter* (KES) group and *Proteus* genus
12. *Salmonella* genus and salmonellosis
13. *Salmonella typhi*, *S. paratyphi* A, B, C
14. *Shigella* genus and shigellosis
15. *Yersinia* genus, *Yersinia pestis* and yersiniosis
16. *Pseudomonas*, *Burkholderia*, *Stenotrophomonas* and *Acinetobacter*
17. *Legionella pneumophila*
18. *Haemophilus* genus
19. *Vibrio cholera*
20. *Vibrio parahaemolyticus* and *V. vulnificus*. *Plesiomonas* and *Aeromonas*
21. *Campylobacter* genus and *Helicobacter pylori*
22. *Brucella* genus and brucellosis.
23. *Bordetella* genus
24. *Pasteurella multocida*, *Francisella tularensis* and *Bartonella*
25. *Clostridium tetani*
26. Gas-gangrene clostridia
27. *Clostridium botulinum* and *Clostridium difficile*
28. *Treponema* genus
29. *Borrelia* and *Leptospira* genus
30. *Corynebacterium diphtheriae*. *Corynebacterium* genus and the diphtheroids
31. *Listeria monocytogenes* and *Erysipelothrix rhusiopathiae*, *Lactobacillus* genus and *Bifidobacterium*. Pre- and probiotics.
32. *Actinomyces* and *Nocardia* genera, atypical and apathogenic *Mycobacteria*
33. Bacteria causing human tuberculosis. *Mycobacterium leprae*
34. *Rickettsiae*, *Orientia* and *Coxiella*
35. *Chlamydia trachomatis*, respiratory tract diseases caused by *Chlamydia*
36. *Mycoplasma* and *Ureaplasma*

Bacterial diagnostics

1. Steps of the preparation and fixation of bacterial smears
2. Native preparations and their applications. Vital staining methods and their applications
3. Gram staining (steps and mode of action)
4. Neisser staining
5. Acid-fast staining (steps and mode of action)
6. Detection of bacterial capsule, spore and flagella
7. Significance and information content of microscopic examinations
8. Control of sterilisation and sterility
9. Principles of the preparation of bacterial culture media
10. Transport and nutrient transport media. Enrichment, selective and differential culture media
11. Rules of surface streaking of bacteria, preparation of bacterial lawn. Definition of pure culture, isolate and strain in bacteriology
12. Aerobic and microaerophilic culture of bacteria
13. Anaerobic culture of bacteria
14. Propagation and maintenance of obligate intracellular bacteria
15. Use of laboratory animals in the medical microbiology
16. The minimal inhibitory concentration (MIC), as well as the minimal bactericidal concentration (MBC) and their determination
17. Methods of antibiotic susceptibility testing of bacteria, measuring the efficacy of antibiotics
18. Modes of action of disinfectants and antiseptics
19. Identification of bacteria at species level
20. Serological reactions utilising agglutination and their applications
21. Serological reactions utilising precipitation and their applications
22. Theory and application of the complement fixation (CF)
23. Theory and application of the immunofluorescent methods (IF)
24. Theory and application of the enzyme linked immunosorbent assays (ELISA)
25. Principles of the evaluation of serological tests. Pair of sera test, meaning of titre
26. Diagnostic (allergic and susceptibility) skin tests and their applications
27. Measurement of toxicity, antitoxins *in vitro* and *in vivo*
28. Theory of serotyping and phagetyping methods and their applications
29. Rules and regulation of the collection, storage and transport of infectious material
30. Significance and major rules of blood cultures (haemocultures)
31. Biofilms and its significance
32. Bacterial causative agents of meningitis and diagnosis
33. Bacterial causative agents of atypical pneumonia and diagnosis
34. Bacterial causative agents of diarrhoea. and diagnosis
35. Urinary infections caused by bacteria and diagnosis
36. Bacterial STD/STIs and diagnosis diagnosztikája