

University of Medicine and Pharmacy Tg Mures.
Faculty of Medicine
Department of Microbiology-Virology-Parasitology

Bacteriology curriculum
Lectures for medical students
Ist semester 2010/2011
2 hours/week (14 weeks)

1. The object and purpose of medical microbiology. History of microbiology.
2. Bacterial morphology. Bacterial cell structure. Chemical composition of bacteria. Growth and multiplication of bacteria. Physical, chemical and biological factors affecting bacteria. Bacterial genetics.
3. Pathogenesis of bacterial infections. Host defense mechanisms. Prevention of infectious diseases.
4. Bacterial classification and nomenclature. Gram-positive cocci (*Staphylococcus* genus, *Streptococcus* genus, *Enterococcus* genus).
5. Gram-negative cocci (*Neisseria gonorrhoeae*, *Neisseria meningitidis*, *Moraxella* genus) Gram-negative enteric rods (*Escherichia coli*, *Shigella* genus, *Salmonella* genus, *Klebsiella* genus, *Proteus* genus and others).
6. Gram-negative non-fermenting rods (*Pseudomonas aeruginosa*, *Acinetobacter* spp.). Gram-negative curved rods (*Vibrio cholerae*, *Helicobacter pylori*, *Campylobacter* spp.) Fastidious, Gram-negative rods involved in respiratory tract infections (*Haemophilus* genus, *Bordetella pertussis*, *Legionella pneumophila*).
7. Gram-positive rods (*Corynebacterium diphtheriae*, *Bacillus anthracis*, *Listeria monocytogenes*).
8. Endogenous anaerobic bacteria (*Actinomycetes*, *Eubacterium*, *Propionibacterium*, *Bacteroides*, *Porphyromonas*, *Prevotella*, *Fusobacterium*, *Leptotrichia*, *Peptococcus*, *Peptostreptococcus*, *Veillonella*.) Exogenous anaerobic bacteria (*Clostridium tetani*, *Clostridium botulinum*, *Clostridium difficile*, gas gangrene clostridia)
9. Spirochetes (*Treponema pallidum*, *Borrelia* spp., *Leptospira* spp.). Acid-fast bacteria (*Mycobacterium tuberculosis*). Bacteria that lack cell wall (*Mycoplasma* spp., *Ureaplasma* spp.). Intracellular bacteria (*Chlamydia* spp., *Chlamydophila* spp.).
10. Normal flora of the human body.
11. Diagnostic principles in infectious diseases according to localization (respiratory tract, urogenital, digestive tract infections, skin and soft tissue infections, systemic infections)
12. Antibiotic susceptibility testing. Antimicrobial resistance.
13. Nosocomial infections.
14. Emergent and reemerging infectious diseases. Bioterrorism.

Practical classes for medical students
Ist semester 2010/2011
3 hours/week (14 weeks)

1. Laboratory safety rules. Microbial growth control.
2. Diagnostic algorithm in bacteriology. Specimen collection and shipment.
3. Study of bacterial morphology. Wet mount. Smears. Staining techniques (Gram stain, acid-fast stain)
4. Cultivation of bacteria. Culture media. Inoculation techniques. Colony morphology. Identification of bacteria according to their biochemical patterns.
5. Diagnostic methods based on antigen-antibody reactions (agglutination, precipitation, immunofluorescence, enzyme-linked immunosorbent assay, Western blot). Detection of bacterial nucleic acid (hybridization, polymerase chain reaction). Methods used for bacterial typing.
6. *In vitro* and *in vivo* pathogenicity tests. Antibiotic susceptibility testing.
7. Diagnosis of infections caused by: *Staphylococcus* spp., *Streptococcus* spp. and *Enterococcus* spp.
8. Diagnosis of infections caused by Gram-negative enteric rods: *Escherichia coli*, *Klebsiella* spp., *Proteus* spp., *Shigella* spp., *Salmonella* spp., *Yersinia* spp.
9. Diagnosis of infections caused by *Vibrio* spp., *Campylobacter* spp., *Helicobacter pylori*. Diagnosis of infections caused by Gram-negative non-fermentative rods (*Pseudomonas aeruginosa*, *Acinetobacter* spp.). Diagnosis of infections caused by *Neisseria* spp.
10. Diagnosis of infections caused by *Haemophilus* spp., *Bordetella* spp., *Legionella* spp. Diagnosis of diphtheria. Diagnosis of infections caused by *Bacillus* spp.
11. Diagnosis of infections caused by anaerobic bacteria.
12. Diagnosis of infections caused by spirochetes (*Treponema pallidum*, *Leptospira* spp., *Borrelia* spp.), *Chlamydia* and *Chlamydophila* spp., mycoplasmas and *Mycobacterium tuberculosis*.
13. Normal flora of the human body. Diagnosis of infections (respiratory and digestive tract infections).
14. Diagnosis of infections (urogenital infections, skin and soft tissue infections, meningitis, systemic infections). Control of cross-transmission in hospital setting in order to prevent nosocomial infections.

References

1. Brooks G.F., Butel, J. S., Morse, S.A.: Jawetz, Melnick, Adelberg's Medical Microbiology, 23 rd edition. 2006
2. Greenwood D., Slack RCB, Peutherer JF: Medical Microbiology. A guide to microbial infections: pathogenesis, immunity, laboratory diagnosis and control. 16th edition, Churchill Livingstone, 2002.
3. Joklik W.K., Willet H.P., Amos D.B., Wilfert C.M., Zinsser – Medical Microbiology 20th edition, Appleton&Lange, 1992
4. Koneman: Color Atlas and Textbook of Diagnostic Microbiology, Lippincott, 2006
5. Levinson W: Medical Microbiology and Immunology. 8th edition, Lange Medical Books, 2004
6. Murray, P.R., Rosenthal, K.S., Kobayashi, G.S., Pfaller, M.A.: Medical Microbiology, Fourth Edition. Mosby 2002.
7. Pusztai R.: Practical classes in medical microbiology and immunology. Szeged, 2002.