

SYLLABUS

<b>Subject:</b>	<b>Microbiology 1 WEDNESDAY Lecture Room 9.45-11.15 P4</b>		
<b>Study Programme:</b>	GM	<b>Study Period:</b>	SS
<b>Evaluation:</b>	4 credits	<b>Subject Type:</b>	Biology 1
<b>Content:</b>	28/28	Total 56	

Department of Medical and Clinical Microbiology

<i>Week</i>	<i>Lecture Title</i>	<i>Practical Lessons</i>
1./14.2.	<b>Introduction to Microbiology</b> (history of medical microbiology, classification of microorganisms, description of the principal groups of bacteria, gliding bacteria, spirochetes, rigid bacteria, mycoplasmas, viruses, prions) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Laboratory protection of infection</b> <i>Laboratory safety rules. Laboratory equipment. Principles of laboratory diagnosis of infection.</i>
2./21.2.	<b>Bacterial Cell Structure</b> (prokaryotic cell structure, nucleus, cytoplasmic membrane, cell wall, protoplasts, spheroplasts, L forms, spores, capsule, glycocalyx, flagella, pili) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Staining procedures in microbiology</b> <i>Monochromatic staining method: evaluation of morphological characteristics of bacteria</i>
3./28.2.	<b>Microbial Genetics</b> ( genetic organization and regulation of bacterial cell, mutation, gene transfer, plasmids, transposons, bacteriophages, genetic engineering) <b>RNDr. Katarína Čurová, PhD.</b>	<b>Staining procedures in microbiology</b> <i>Gram staining method: preparation of slide, staining characteristics of different bacteria</i>
4./6.3.	<b>Growth and Cultivation of Bacteria</b> (growth, growth curve, requirements for growth, environmental factors affecting growth, agents affecting growth of bacteria- disinfection and sterilisation, metabolism, sources of metabolic energy, cultivation methods, microbial metabolism) <b>MVDr. Vladimír Hrabovský, PhD.</b>	<b>Staining procedures in microbiology</b> <i>Ziehl-Neelsen and Neisser staining methods: preparation and evaluation of slide</i>
5./13.3.	<b>Pathogenicity of Bacteria</b> (bacterial /1virulence factors, invasiveness, fimbrial and afimbrial adhesins, toxic enzymes, exotoxins and endotoxin) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Bacterial genetics</b> <i>Isolation and visualisation of plasmid DNA, Conjugal transfer of DNA</i>
6./20.3.	<b>Immune Mechanisms Against Infections</b> (nonspecific and specific immune mechanisms, antibacterial, antiviral, antiprotozoal and antifungal defence mechanisms, hypersensitive reactions against agents causing infectious disease) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Collection, handling, transportation and processing of clinical specimen</b> <i>Demonstration of methods for disposal of infectious material Preparation of culture media</i>

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7./27.3.	<b>Antimicrobial Agents</b> (inhibitors of cell wall synthesis, inhibitors of protein synthesis, inhibitors of nucleic acid synthesis, miscellaneous antibacterial agents) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Culture media</b> <i>Inoculation of agar plates, condition for cultivation of aerobes and anaerobes, cultivation of bacteria in liquid and solid media</i>
8./3.4.	<b>Antimicrobial Agents</b> (intrinsic and acquired resistance, plasmids and transposons, combination of antimicrobial agents, side effects of antimicrobial agents) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Identification and differentiation of bacteria</b> <i>Demonstration of biochemical characteristics of bacteria. Evaluation of bacteria cultivation. Demonstration of MALDI TOF Mass Spectrometry for identification of bacteria</i>
9./10.4.	<b>Antigen-antibody reactions in microbiology</b> ( agglutination, precipitation, complement fixation, ELISA, immunofluorescence, immunoblotting) <b>RNDr. Katarína Čurová, PhD.</b>	<b>Evaluation of virulence</b> <i>Determination of capsule and plasmacoagulase. Demonstration of Microarray Scanner</i>
10./17.4.	<b>Normal Microbial Flora of the Human Body. Prophylactic immunization</b> (passive immunization - homologous and heterologous, active immunization - types of vaccine: toxoids, inactivated vaccines, attenuated live vaccines, hazards if immunization) <b>MVDr. Vladimír Hrabovský, PhD.</b>	<b>Sensitivity testing of bacteria to antibiotics</b> <i>Diffusion method. Demonstration of BACMED 4i - analyser of inhibition zones and equivalence of MIC</i>
11./24.4.	<b>Staphylococcus</b> (description of coagulase positive and negative staphylococci, pathogenesis, laboratory diagnosis, treatment, epidemiology) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Sensitivity testing of bacteria to antibiotics</b> <i>Evaluation of diffusion method from 10th practice. Dilution method. Demonstration of beta-lactamase enzyme production in bacterial population</i>
12./1.5.	<b>Streptococcus</b> ( classification of streptococci; description, pathogenesis, laboratory diagnosis, epidemiology and chemotherapy) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Serology</b> <i>Evaluation of dilution method from 11th practice Direct (tube) agglutination</i>
13./8.5.	<b>Credit Test</b> <b>Pneumococcus and enterococcus</b> (classification of pneumococci and enterococci, pathogenesis, laboratory diagnosis, treatment, epidemiology, control) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Serology</b> <i>Slide agglutination (identification of bacterial antigens Immunofluorescence, precipitation</i>
14./15.5.	<b>Retake of Credit Test</b> <b>Neisseria</b> ( classification, description, pathogenesis, clinical infections, laboratory diagnosis, treatment, epidemiology, control) <b>Dr.h.c. prof. MUDr. L. Siegfried, CSc.</b>	<b>Compensation of practical lessons</b>

**Conditions to be fulfilled for getting the credit**

1. 60 % of total points a student may obtain in the credit test.
2. 60 % of 100 points a student may obtain in 10 short tests (composed of 10 questions) (1question = 1 point) in practical exercises starting from the 2<sup>nd</sup> up to the 11<sup>th</sup> week of summer term.
3. Active participation in practical exercises (demonstration of knowledge related to topic of given practical exercise).

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The Head of Institute