FACULTY OF DENTISTRY

ENGLISH LANGUAGE PROGRAM

2020/2021. Fall semester

MICROBIOLOGY LABORATORY PRACTICES

1.	08, 09. Sept.	**Introduction to basic microbiology, laboratory rules.** **Microscopic examination of microbes** * Wet mount, vital staining of yeast * Preparation of smears (*S. epidermidis, E. coli, B. cereus*) * Simple and Gram staining * Preparation of smears from the surfaces of the tooth
2.	15, 16. Sept.	**Cultivation of bacteria** * Culture media (broth, agar-, blood agar- and chocolate agar plates, slant and stab forms) samples. Differential and selective culture media * Cultivation of anaerobic bacteria (supplemented thioglycolate and chopped meat medium, GasPack jar), Anaerobic chamber * Colony morphology of bacteria (*S. epidermidis, S. aureus, S. pyogenes, S. mitis, E. coli, Klebsiella, P. aeruginosa, Proteus, Serratia, B. cereus, H. influenzae*) * Procedure for making single colonies on plates *S. epidermidis* * Transport media, bloodculture (haemoculture)
3.	22, 23. Sept.	**Methods for sterilization and disinfection** **Macroscopic evaluation of the cultures of the previous practice** * Control of sterility (culture media: thioglycolate and glucose containing broth media) * Examination of the effect of an antiseptic on the bacterial flora of the skin (culturing before and after hand washing in the antiseptic solution on agar plates) * Microbial corrosion
4.	29, 30 Sept.	**Macroscopic evaluation of the cultures of the previous practice** **Antibiotic susceptibility of microbes** * Measurement of antibacterial activity (tube dilution method, plate dilution tests. Diffusion tests: well, and filter paper disc) * Examples for antibiotic susceptibility (*S. aureus, E. coli, S. pyogenes, P. aeruginosa)* * E -test, kits * Determination of antibiotic susceptibility of different bacteria (*S. aureus, E. coli, P. aeruginosa*) * Determinations of MIC and MBC for bacteria * Monitoring test of the antibiotic level in the serum

5.	06, 07. Oct.	**In vitro antigen-antibody reactions (serological methods)** * **Macroscopic evaluation of the cultures of the previous practice** Agglutination (qualitative: serotyping of *E. coli* on slide, quantitative: tube dilution test) * Precipitation (ring test, agar gel diffusion test, immun-electrophoresis) * Indirect agglutination * ~~Complement fixation (CF): titration of complement~~ * Enzyme-linked immunosorbent assay (ELISA) * Immunofluorescent methods
6.	13, 14. Oct.	***Midterm I.*** **(General bacteriology and immunology*)*** ***PYOGENIC COCCI*** **Gram-positive cocci** * Cultures: o agar plates: *S. epidermidis., S. aureus* o blood agar plates: S. *epidermidis., S. aureus, S. pyogenes, S. pneumoniae, S. mitis, E. feacalis* o chocolate agar plate: *S. pyogenes, S. mitis, S. pneumoniae, E. faecalis* * Smears: *S. aureus, S. pyogenes, S. pneumoniae* (Gram stained) * Enzyme reactions: o catalase test on slide (*S. aureus*) o DNase production (*S. aureus*) o Coagulase test (S.aureus) * *S. mutans* on MS medium * Antibiotic susceptibility of *S. aureus, S. pyogenes* **Gram-negative cocci** * Culture: *N. pharyngitidis* on agar plate * Smears: Gram-stained smear of *Neisseriae* and methylene-blue stained smear of gonorrhoeal exudate * Enzyme reaction: oxidase test (*N. pharyngitidis)*
7.	20, 21. Oct	**Enteric Gram-negative rods (*Enterobacteriaceae*)** * *Smears: E. coli* (Gram stain), Klebsiella (capsule staining) * *Cultures:* agar plates: *E. coli, Klebsiella, Proteus* eosin methylene blue (EMB): *E. coli, Klebsiella, Proteus* * *Selective cultures:* deoxycholate-citrate (DC) agar: *Shigella* and *E. coli*, bismuth sulfite medium: *S. typhi* * *Biochemical reactions:* o carbohydrate fermentation in TSI media (*E. coli*, Proteus, Klebsiella, Shigella, *S. typhi* and *S. paratyphi*) o H_2S-, indol production o Urea degradation test * *Serology:* Widal test (tube dilution test: *S. typhi*) **Vibrios** (sterile TCBS culture medium) ***Campylobacter* spp.*, Helicobacter pylori*** (slides) * Sampling containers **Gram-negative non-fermenting rods**

		* Pseudomonas on agar plate
8.	27, 28. Oct	**Gram-negative coccobacilli** * Haemophilus on chocolate agar plate and satellite phenomenon * Bordetella cultivation (sterile Bordet-Gengou medium) * Legionella (sterile BCYE medium) * *Actinobacillus actinomycetemcomitans* (smear from dental sulcus) Slides. ***Mycobacteria*** * Cultures :*M. tuberculosis* and *M. bovis*, atypical and apathogenic mycobacteria (Loewenstein-Jensen, Sula, Sauton and Dubos media) * Stained smear of sputum (acid-fast-staining) * Sampling containers
9.	03, 04. Nov.	**Gram-positive bacilli** * Cultures: *C. diphtheriae* on Löffler's coagulated serum slant medium and on tellurite plate * Smear of *C. diphtheriae* (stained) * Virulence tests: in vitro: agar gel precipitation **Endospore-forming Gram-positive aerobic and anaerobic bacilli** * Cultures: *B. cereus* on agar plate, *C. perfringens* and *C. tetani* in liquid media (containing thioglycolate or chopped meat) * Smears: Gram-stained preparations of endospore-forming bacteria **Gram-negative anaerobic rods** * *Bacteroides* * *Fusobacterium* * *Prevotella, Porphyromonas* **Gram-positive anaerobic rods** * *Lactobacillus* * *Bifidobacterium* * *Propionibacterium* * *Actinomyces*
10.	10, 11. Nov.	**Spirochaetales** * *Treponema pallidum* morphology and disease, Serology: non-treponemal antibody tests (flocculation test: VDRL, CF test) * Borrelia (slides) * Leptospira in Korthof medium and stained smear of Leptospira **Rickettsia** * Serology: Weil-Felix reaction **Chlamydia** **Mycoplasma** (BEA, BEG cultures)
11.	17, 18. Nov.	**Midterm II. Systemic bacteriology** **Medically important fungi** * Cultures: *C. albicans,* Penicillium, Aspergillus, Mucor on Sabouraud's agar plate * Block preparation of different molds * Smear: *C. albicans* (methylene-blue)

		Throat and nose bacterial samples, inoculation of blood and chocolate agar
12.	24, 25. Nov.	**Macroscopic evaluation of the cultures of throat and nose samples.** **General virology** * Cultivation of viruses: tissue cultures * Morphology of viruses * Cell-virus interactions (CP on tissue culture, HA in microplate) * Serological tests: HI, CF, IF, Paul-Bunnel test * Tests for detection of nucleic acid (PCR, hybridization) * Vaccines * Bacteriophages (morphology and phage typing) * Diagnosis of viral infections
13.	01, 02. Nov.	**Most important DNS and RNS viral diseases** * Viral diseases in oral cavity
14.	08, 09. Dec.	**Medical parasitology** (the most important parasitic protozoa and helminths): macroscopic and microscopic preparations Sampling containers. **Summary of microbiological laboratory techniques and diagnostic procedures**