Program:
Monday 23.10.2017
Themes: Antibiotics, antibiotic resistance, antimicrobial susceptibility testing methods and resistance epidemiology.

12.00 Welcome and introduction to the course.
Antibiotics
Basic concepts in antibiotics and antibiotic resistance
- Antibiotics: history, classification and mode of action.
- Basics concepts in antibacterial resistance – is it all about natural selection?

14.00 **Antimicrobial susceptibility testing and important clinical resistance mechanisms**
- Antimicrobial susceptibility testing; concepts, methods and interpretation.
- Challenges in Gram-negative bacteria exemplified by beta-lactamases and colistin resistance.
- Challenges in Gram-positive bacteria exemplified by glycopeptide and linezolid resistance in enterococci.

16.00 Group work and disclosing of group work in plenum.
18.00 End

Social gathering in the evening

Tuesday 24.10.2017
Themes: Resistance transmission: mechanisms and evolution.

08.30 **Genetic mechanisms for resistance spread.** 30 min lectures 15 min for discussion
- Transduction/bacteriophages: examples and limitations.
- Transformation: within and between species.
- Conjugation: promiscuity of mobile genetic elements (MGEs).

11.00 **Evolution of resistance.** (lunch break 11.45-12.45)
- Drivers in the development and spread of antimicrobial resistance.
- Reversibility of antibiotic resistance – easy to get and hard to get rid of?
- Evolution and resistance.

14.15 Group work and disclosing of group work in plenum.
16.15 End.

Wednesday 25.10.2017
Themes: Molecular methods for typing. Laboratory demonstrations antimicrobial susceptibility testing (AST). Antibiotic discovery and development.

08.30 **Molecular methods for typing of resistant bacterial clones and MGEs.**

- Defining bacterial clonality by molecular typing methods.
- How do we handle big data in whole genome sequencing (WGS)?
- WGS for AST: possibilities and limitations.

11.00 Introduction to AST in practice.
11.20 Lunch
12.20 **Laboratory demonstrations of AST methods** (disk diffusion, gradient test, micro broth dilution).

14.00 **Antibiotic discovery and development.**
- Concepts in drug discovery.
- Bioprospecting for novel antimicrobial agents.
- Structure based antibiotic discovery.

16.00 End.

Thursday 26.10.2017
Theme: Alternative anti-infective strategies.

08.30 **Alternative anti-infective strategies**
- Selection inversion.
- Anti-virulence strategies; know your enemies and disarm them.
- Microbiome based strategies for decolonization of multidrug resistance and infection prevention.

11.00 **Selected presentations from participants.**
Course evaluation.
13.00 End