

Course description

Informing students on course requirements

Program: Full-time PhD program, elective course, Medical Microbiology and Antimicrobial Immunity Subprogram
Course: Emerging and Re-emerging Infectious Diseases
Course code: AOKDI-ASZV-14
Academic year/Semester: 2 nd or 3 rd semester of the academic year
Educator and contact details (e-mail): Prof. Dr. Burián Katalin , burian.katalin@med.u-szeged.hu
Type of course: <u>lecture/seminar/practice/laboratory</u>
Weekly hours of the course: 2
Credit vale of the course: 6
Type of examination: <u>final exam at the end of semester</u> , practice exam, other:.....
Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): medical microbiology/ microbiology
Purpose of course: The aim of the course is to provide students with a comprehensive and up-to-date understanding of the biology, molecular and cellular pathogenesis, and epidemiological significance of newly emerging and re-emerging human pathogens.
Outcome requirements of the course (specific academic results to be established by the course): Upon completion of the course, the student: Understands the major molecular and cellular mechanisms involved in the pathogenesis of emerging and re-emerging viral, bacterial, parasitic, and fungal infections. Is able to interpret the importance of modern diagnostic and molecular epidemiological tools (e.g., PCR, sequencing, phylogenetic analysis) in the identification of novel pathogens. Can compare the virulence and immune evasion strategies of different pathogens and explain their clinical implications.

Critically evaluates the scientific literature and integrates current research findings into their understanding of microbial pathogenesis.

Applies the acquired knowledge in research, diagnostic, or public health contexts related to infectious disease control.

Topics:

SARS-CoV and MERS-CoV – Twin Threats Before the Pandemic Era

Plasmodium knowlesi: The Emerging Fifth Human Malaria Parasite

Beyond Lyme Disease: The Emerging Human Pathogen *Borrelia miyamotoi*

Nipah and Hendra Viruses: Emerging Henipaviruses at the Human–Animal Interface

Diagnostic Challenges and Immune Response in *Neoehrlichia mikurensis* Infections

The Reemergence of *Bordetella pertussis* in Europe: Molecular Mechanisms and Vaccine Escape

The Roadblocks to Polio Eradication: Lessons from the Middle East

SFTSV: A Novel Phlebovirus with Pandemic Potential

A Global Health Crisis: The Emergence of Untreatable *Neisseria gonorrhoeae*

Emergence of Highly Virulent *Streptococcus pyogenes* Lineages in Europe:

Lessons from the M1UK Clone

Mpox: An Old Virus with a New Epidemiology

Zika Virus: Molecular Mechanisms of Neurotropism and Fetal Pathogenesis

Supporting methods to achieve learning outcomes:

Publications available through PubMed search. PowerPoint presentation provided by the lecturer.

Evaluation of the acquisition of expected learning outcomes:

Participation in the seminar is compulsory.

Two absences are allowed; if more than two sessions are missed, the absences must be justified with appropriate documentation.

Course requirements:

Active participation in seminar sessions is a prerequisite for completing the course.

Examination form:

The final assessment is a written test, graded on a five-point scale as follows:

90–100% – excellent (5)

80–89% – good (4)

70–79% – satisfactory (3)

60–69% – pass (2)

0–59% – fail (1)

Mandatory reading list:

PowerPoint presentation provided by the lecturer.

Recommended reading list:

Publications available through PubMed search are recommended by the lecturer.

Indicating course requirements on Coospace scene (summary)

Description (public):

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Outcome requirements of the course:

Understands the major molecular and cellular mechanisms involved in the pathogenesis of emerging and re-emerging viral, bacterial, parasitic, and fungal infections.

Is able to interpret the importance of modern diagnostic and molecular epidemiological tools (e.g., PCR, sequencing, phylogenetic analysis) in the identification of novel pathogens.

Can compare the virulence and immune evasion strategies of different pathogens and explain their clinical implications.

Critically evaluates the scientific literature and integrates current research findings into their understanding of microbial pathogenesis.

Applies the acquired knowledge in research, diagnostic, or public health contexts related to infectious disease control.

Course requirements:

Active participation in seminar/practice sessions is a prerequisite for completing the course.

Examination form:

The final assessment is a written test, graded on a five-point scale as follows:

90–100% – excellent (5)

80–89% – good (4)

70–79% – satisfactory (3)

60–69% – pass (2)

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Topics:

1. SARS-CoV and MERS-CoV – Twin Threats Before the Pandemic Era
2. *Plasmodium knowlesi*: The Emerging Fifth Human Malaria Parasite
3. Beyond Lyme Disease: The Emerging Human Pathogen *Borrelia miyamotoi*
4. Nipah and Hendra Viruses: Emerging Henipaviruses at the Human–Animal Interface
5. Diagnostic Challenges and Immune Response in *Neoehrlichia mikurensis* Infections
6. The Reemergence of *Bordetella pertussis* in Europe: Molecular Mechanisms and Vaccine Escape
7. The Roadblocks to Polio Eradication: Lessons from the Middle East
8. SFTSV: A Novel Phlebovirus with Pandemic Potential

9. A Global Health Crisis: The Emergence of *Untreatable Neisseria gonorrhoeae*
10. Emergence of Highly Virulent *Streptococcus pyogenes* Lineages in Europe: Lessons from the M1UK Clone
11. Mpox: An Old Virus with a New Epidemiology
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