



UMS+24^o

SERIES

4th - 6th April 2024

MONA
PLAZA HOTEL,
Belgrade,
Serbia

XIII CONGRESS OF MICROBIOLOGISTS OF SERBIA
with international participation

MIKROMED REGIO 5

**FROM BIOTECHNOLOGY TO HUMAN
AND PLANETARY HEALTH**



BOOK OF ABSTRACTS

ORGANIZER:



SUPPORTED BY:



Federation of European
Microbiological Societies



Republic of Serbia

MINISTRY OF SCIENCE,
TECHNOLOGICAL DEVELOPMENT AND INNOVATION

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Message from the organizing committee

Dear colleagues and friends,

The objective of the event was to present the latest developments in microbiology that contributed to a better understanding of the role of microorganisms in nature and to bring together microbiologists from Serbia and the region with professionals from all over Europe, including microbiologists of various disciplines, bioinformaticians, geneticists, molecular biologists, biochemists, epidemiologists, pediatricians, infectious disease physicians, and all other scientists with common interests.

This regional meeting addressed all prevailing microbiological issues and offered solutions to overcome them by world-class experts in the field. The resistance of microorganisms to antimicrobial drugs is causing major problems in veterinary and human medicine, necessitating the improvement of vaccines and the discovery of new drugs, but also alternative treatment models. Growing antimicrobial resistance, especially biofilm-related, requires alternative measures to biocontrol the spread of the microorganisms in various environments. These sessions discussed possible alternatives to common antimicrobials, ranging from bacteriophage applications, new natural compounds biotechnology or nanotechnology, as well as biological control for the inactivation of pathogenic and/or resistant phenotypes of microorganisms.

In addition, food manufacturers and retailers have been trying for decades to reduce the material damage and risks to human health posed by biofilms in food processing facilities. The environment is already too polluted by many human missteps, so any help from microorganisms to remove or process waste materials can be a big help. We are getting better and better at using microorganisms in technological processes, firstly in the medical field, but also in agriculture, industry and the energy sectors.

Our knowledge of how microbial diversity is distributed in natural environments and how microbes influence ecosystems is constantly evolving as public databases are established and new techniques based on massive sequencing are developed. The microbiomes found in anthropogenic environments and on human-made materials are generally much less complex than those found in natural environments. Despite this simplicity, it is very difficult to link cause and effect when it comes to determining the role of individual microorganisms. Improved genome engineering tools in model organisms allow for a comprehensive remodeling of metabolic and regulatory networks.

At the same time, a growing number of non-model organisms can be modified with different traits so that they can be further used in different applications and environments. This expanded range of engineering capabilities and modified species brings their application in the real world closer and has the potential to make a real contribution to sustainability and addressing global health challenges.

Microorganisms are the key drivers of ecosystem functions, and microbial diversity plays a central role in maintaining the stability and sustainability of ecosystems. These sessions were examined some of the principles that shape and maintain this biodiversity and explore the factors that shape microbiomes and contribute to the success of specific members of communities in different habitats.



Presentations were focused on omics techniques such as metagenomics, metatranscriptomics, proteomics and metabolomics, which are used to better understand why the health of humans, animals and plants depends on microbial interactions. In this way, the complex microbiomes and the interactions between the microbiota and a variety of host organisms from different domains of life were explored.

We strongly believe that the Congress was an excellent place to exchange and combine scientific ideas among experts and participants, with great opportunities to start new international collaborations and joint scientific projects. We have received an overwhelming response to our call, with numerous talented applicants, more than 350 participants from more than 20 countries (Austria, Belgium, Bosnia and Herzegovina, Croatia, France, Georgia, Germany, Greece, Hungary, India, Iraq, Italy, Montenegro, Namibia, North Macedonia, Portugal, Russian Federation, Serbia, Slovenia, Netherlands and United States) applying for the limited number of available grant awards (we have accepted 29 participants). In addition to presentations by invited speakers, the programme also included poster presentations by young researchers and PhD students. We were honoured to welcome 62 lecturers, 15 offered talks and 8 panelists and presenting cases. We have organized oral presentations in 15 parallel sessions, complemented by two panel discussions and a workshop entitled "NGS in Microbiology". We would like to thank all participants for their scientific commitment, especially for the more than 170 abstracts submitted, which contributed significantly to the success of the Congress. The Congress is accredited by the Health Council of the Republic of Serbia under the registration number A-1-185/24.

We hope you enjoyed the Congress programme and found it stimulating and informative. We also hope that you enjoyed the beauty of Belgrade and the Serbian hospitality. We sincerely wish you health, love and happiness and look forward to the new meetings.

Sincerely,



Ivica Dimkić
University of Belgrade
Faculty of Biology, Serbia

Scientific
Committee
Chairperson



Dušan Kekić
University of Belgrade
Faculty of Medicine, Serbia

Organizing
Committee
Chairperson



Lazar Ranin
President of the Serbian Society
for Microbiology
Chairperson

Scientific & Organizing
Committee
Co-Chairperson



General information

CONGRESS VENUE

The meeting was held at the Hall „Donji Dorćol“ and Hall „SCHONDA 4“, Mona PLAZA hotel, located at Cara Uroša 62-64, Belgrade, Serbia; Hall „Beogradska panorama“ and Hall „Club“, situated Hotel Palace, Topličin Venac 23, Belgrade, Serbia and Institute of Molecular Genetics and Genetic Engineering, Vojvode Stepe 444a, Belgrade, Serbia.

REGISTRATION OF PARTICIPANTS

Registration desk was open on Thursday, April 4 from 08:00 in front of Hall „Donji Dorćol“, Mona PLAZA hotel, as well as on Friday, April 5 and Saturday, April 6 at the same place. Daily updates on the workshop sessions and social events were available at the registration desk and through the specially designed application for this Congress (<https://play.google.com/store/apps/details?id=com.Mikrobiolozi>). All participants and accompanying persons were kindly requested to wear their accreditation badges during the scientific sessions and workshop social events.

LANGUAGE

The official language of the congress was English.

SOCIAL EVENTS

A group photo was taken in front of Mona PLAZA hotel on Thursday, April 4th, at 11:50. The poster viewing session took place at Hall ‘Club’ of Hotel Palace, ground floor, located at Topličin Venac 23, Belgrade, on Friday from 17:45 to 19:15.”

INFORMATION FOR PRESENTERS

Oral presentations were held at the Hall “Donji Dorćol” and Hall “SCHONDA 4” , First floor of the hotel Mona PLAZA, Cara Uroša 62-64, Belgrade, from April 4th to 6th.



UMS+24^o SERIES

04th - 06th April 2024

MONA PLAZA Hotel, Belgrade

XIII CONGRESS OF MICROBIOLOGISTS OF SERBIA
MIKROMED REGIO 5

WITH INTERNATIONAL PARTICIPATION

**FROM BIOTECHNOLOGY
TO HUMAN AND
PLANETARY HEALTH**



CONGRESS



PROGRAMME

ORGANIZER :



SUPPORTED BY :



Federation of European
Microbiological Societies



Republic of Serbia
MINISTRY OF SCIENCE,
TECHNOLOGICAL DEVELOPMENT AND INNOVATION



UMS 24 PROGRAMME

Thursday, April 4, 2024

08:00-09:00 Registration of participants

Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

ORGANIZATIONAL OPENING REMARKS - Ivica Dimkić, Dušan Kekić & Lazar Ranin

08:45-09:30 **Jelena Begović** - Ministry of Science, Technological Development and Innovation
Ljubiša Stanisavljević - Dean of the Faculty of Biology of the University of Belgrade
Luciano Catani - Science Attaché at the Italian Embassy in Belgrade, Serbia
Vaso Taleski - FEMS Director of Events & Internationalization FEMS - 50 years of successful connecting people and sharing knowledge in microbiology worldwide

SESSION IA-1

MICROBIAL GENETICS, METAGENOMICS AND METAPROTEOMICS (PART 1) – MICROBIOMES AND RECENT DEVELOPMENTS & PROBIOTICS

Chaired by: Maja Rupnik & Nataša Golić

- 09:30-09:55 **Maja Rupnik (Slovenia)**: The role of gut microbiota on infection with multiresistant bacteria
- 09:55-10:20 **Nataša Golić (Serbia)**: The use of integrative multi-omics approach in cultivation and characterization of gut bacteria related to microbiota-gut-brain axis as a source for Next Generation Probiotics
- 10:20-10:45 **Vladimir Milivojević (Serbia)**: The importance of probiotics and modulation of microbiota in gastroenterology
- 10:45-11:10 **Mirjana Rajilić-Stojanović (Serbia)**: Modulation of human mycobiota as a tool for promoting health
- 11:10-11:35 **Marina Atanasković-Marković (Serbia)**: Dangerous relations: bacteria, antimicrobial therapies, and allergic diseases
- 11:35-11:50 **Hristina Mitrović (Serbia, Offer. pres.)**: From gut to lab: unlocking anti-inflammatory potential with GABA-producing bacteria
- 11:50-12:10 **AbelaPharm (INDUSTRY LECTURE) - Nada Tršić-Milanović (Serbia)**: From microscope to shelf: How our research becomes strength

Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IB-1

INDUSTRIAL AND FOOD MICROBIAL BIOTECHNOLOGY (PART 1) - MICROBIAL VALORIZATION OF WASTES AND SECONDARY MATERIALS & BIOTECHNOLOGY AND SYNTHETIC MICROBIOLOGY

Chaired by: Vera Karličić & Alexander Osmolovskiy

09:30-09:55 **Alexander Osmolovskiy (Russian Federation)**: Proteinases of filamentous fungi as activators of hemostatic system proteins: key properties and application



- 🕒 09:55-10:20 **Nemanja Mirković (Serbia):** Bacteriocins: past, current knowledge and future prospects
- 🕒 10:20-10:45 **Marina Jovanović (Serbia):** Valorization of psychobiotics and agri-food by products as functional ingredients
- 🕒 10:45-11:10 **Vera Karličić (Serbia):** Ecological services of beneficial microorganisms as a paradigm of sustainable agroecosystems
- 🕒 11:10-11:25 **Vincent Léguillier (France, Offer. pres.):** Structural optimization of an I-motif aptamer for the specific detection of *Staphylococcus aureus*
- 🕒 11:25-11:40 **Marija Duvnjak (Croatia, Offer. pres.):** Aerobic stability of the alfalfa silage
- 🕒 12:10-12:30 **COFFEE BREAK**
- 🕒 12:20-12:30 **GROUP PHOTO IN FRONT OF THE MONA PLAZA HOTEL**

📍 Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIA-1

ACTIVE IMMUNIZATION AS THE KEY ELEMENT IN INFECTION PREVENTION AND CONTROL (PART 1) - VIRAL VACCINES

Chaired by: **Maja Stanojević & Aleksandra Knežević**

- 🕒 12:30-12:55 **Maja Čupić (Serbia):** Vaccines for influenza and Covid 19 - what we need to know
- 🕒 12:55-13:20 **Aleksandra Knežević (Serbia):** HPV vaccines in the cancer prevention – recommendations and future prospective
- 🕒 13:20-13:45 **Maja Stanojević (Serbia):** Poliovirus eradication: challenges of containment
- 🕒 13:45-14:10 **Ivana Lazarević (Serbia):** Advances, challenges and novelties in HBV and HCV vaccines development
- 🕒 14:10-14:35 **Ana Banko (Serbia):** Development of new viral vaccines with a focus on the new RSV vaccine

📍 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIB-1

ENVIRONMENTAL MICROBIOLOGY AND BIOTECHNOLOGY (PART 1) - HOST-MICROBE INTERACTIONS & TOWARDS A MORE SUSTAINABLE AGRICULTURE AND SOIL MICROBIAL LEGACY

Chaired by: **Ines Mandić Mulec & Ivica Dimkić**

- 🕒 12:30-12:55 **Ines Mandić Mulec (Slovenia):** Social strategies by beneficial bacterium *Bacillus subtilis*
- 🕒 12:55-13:20 **Vittorio Venturi (Italy):** Inter-species bacterial signaling in the plant microbiome
- 🕒 13:20-13:45 **Stéphane Compant (Austria):** Harnessing fungal-bacterial interactions to improve plant growth and health
- 🕒 13:45-14:10 **Ioannis Kampouris (Germany):** A consortium of plant-beneficial microorganisms mitigates drought effects on maize by aiding the recruitment of focal soil microorganisms in rhizosphere
- 🕒 14:10-14:25 **Dmitrii Deev (Slovenia, Offer. pres.):** Enhancing bioremediation efficiency: novel isolation techniques for microbial consortia in recalcitrant PAH-contaminated soils
- 🕒 14:25-14:40 **Ivana Galić (Serbia, Offer. pres.):** Soil microbiome diversity in maize-winter wheat crop rotation

🕒 14:40-15:30 LUNCH BREAK

📍 Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

15:30-15:50 EuroMedicina (INDUSTRY LECTURE) - Aleksa Jovanović (Serbia): EXS2600 MALDI TOF - new possibilities

SESSION IIIA-1

ENVIRONMENTAL MICROBIOLOGY AND BIOTECHNOLOGY (PART 2) - TOWARDS A MORE SUSTAINABLE AGRICULTURE AND SOIL MICROBIAL LEGACY & PHYTOPATHOLOGY

Chaired by: Jovana Grahovac & Aleš Lapanje

- 🕒 15:50-16:15 **Aleš Lapanje (Slovenia):** Harnessing spatial microbiome dynamics for cutting-edge environmental biotechnology
- 🕒 16:15-16:40 **Đorđe Bajić (The Netherlands):** Using fitness landscapes to engineer optimal function in microbial communities
- 🕒 16:40-17:05 **Matjaž Hladnik (Slovenia):** Comparative analysis of phyllosphere microbiota in olive leaf spot disease
- 🕒 17:05-17:30 **Jovana Grahovac (Serbia):** Microbial biomass production and application within biorefinery concept
- 🕒 17:30-17:45 **Marko Vincenković (Croatia, Offer. pres.):** Preparation, characterization and application of copper microparticles in controlling of phytopathogenic fungi

📍 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIIB-1

PANEL SESSION - INFECTIONS IN PATIENTS ON IMMUNOMODULATION AND IMUNOSUPRESIVE THERAPIES

Moderator: Dušan Kekić

- 🕒 15:50-17:45 **PANELISTS:**
 - Gordana Petrović (Serbia)
 - Tamara Knežević (Serbia)
 - Borko Gobeljić (Serbia)
 - Aleksandra Plavšić (Serbia)
 - Ana Banko (Serbia)
- PRESENTING CASES:**
 - Tijana Đerić (Serbia):** Occurrence of pneumonia in a patient on biological therapy due to TRAPS
 - Olga Odanović (Serbia):** Infections in patients with inflammatory Bowel disease on biologic therapy: Challenges in management
 - Ljubica Matic (Serbia):** Biological therapy and infections in hematopoietic stem cell transplantation
 - Uroš Karić (Serbia):** A series of rare infectious complications in an immunosuppressed patient with SLE

🕒 17:45-18:10 COFFEE BREAK



 Venue - Hall „DONJI DORĆOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IVA-1

INDUSTRIAL AND FOOD MICROBIAL BIOTECHNOLOGY (PART 2) - FOOD MICROBIOLOGY

Chaired by: **Mirna Mrkonjić Fuka & Konstantinos Papadimitriou**




-  18:10-18:35 **Tamar Sachaneli (Georgia):** Microbial diversity of Georgian artisanal cheese production
-  18:35-19:00 **Konstantinos Papadimitriou (Greece):** Multi-omics approaches to characterize the microbiome of certain greek artisanal fermented foods and wines
-  19:00-19:25 **Mirna Mrkonjić Fuka (Croatia):** Fermented food ecosystems - a treasure chest of untapped microbial potential
-  19:25-19:40 **Marija Todorovska Ivkovikj (North Macedonia, Offer. pres.):** Isolation and characterization of yeasts from Macedonian vineyards for production of Macedonian unique wine

 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IVB-1

ACTIVE IMMUNIZATION AS THE KEY ELEMENT IN INFECTION PREVENTION AND CONTROL (PART 2) - VIRAL VACCINES

Chaired by: **Danijela Miljanović & Ivana Lukić**

-  18:10-18:35 **Danijela Miljanović (Serbia):** MMR vaccine and seroprevalence of measles, mumps and rubella IgG antibodies among young medical students in Serbia
-  18:35-19:00 **Ivana Lukić (Serbia):** mRNA vaccine manufacturing – challenges in plasmid DNA cloning vector design
-  19:00-19:15 **Marko Janković (Serbia, Offer. pres.):** Human cytomegalovirus oncoprotection across diverse populations, tumour histologies, and age groups: the relevance for prospective vaccinal therapy

 **Friday, April 5, 2024**



-  08:00-09:00 **Registration of participants**

 Venue - Hall „DONJI DORĆOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IA-2

MULTI DRUG AND PAN DRUG RESISTANCE & HEALTH MICROBIOLOGY AND BIOTECHNOLOGY (PART 1)

Chaired by: **Ina Gajić & Paul Cos**

-  09:00-09:25 **Paul Cos (Belgium):** Challenges and lessons learned from antimicrobial research projects
-  09:25-09:50 **Ina Gajić (Serbia):** Genomic epidemiology of carbapenem-resistant *Pseudomonas aeruginosa*



- 🕒 09:50-10:15 **Katarina Novović (Serbia):** *Acinetobacter baumannii* resistant to last line antibiotics: an emerging threat in Western Balkan
- 🕒 10:15-10:40 **Dušan Milivojević (Serbia):** From soil to lab: Exploring toxicology with *Caenorhabditis elegans*
- 🕒 10:40-10:55 **Miloš Jovičević (Serbia, Offer. pres.):** High-level resistance of carbapenem-resistant *Klebsiella pneumoniae* to novel β -lactam- β -lactamase inhibitor combinations in clinical settings in Serbia
- 🕒 10:55-11:20 **Jose Alexander (USA) - online:** Understanding antimicrobial resistance for testing and treatment strategies
- 🕒 11:20-11:40 **bioMérieux (INDUSTRY LECTURE) - Snežana Jovanović (Serbia):** Syndromic PCR or how to solve diagnostic Rubik's cube easily

📍 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IB-2

MICROBIAL GENETICS, METAGENOMICS AND METAPROTEOMICS (PART 2) - MICROBIOMES AND RECENT DEVELOPMENTS & MICROBIAL GENOMES AND THEIR EVOLUTION

Chaired by: Livia Leoni & Gergely Maróti

- 🕒 09:00-09:25 **Livia Leoni (Italy):** Role of stringent response in *Pseudomonas aeruginosa* virulence
- 🕒 09:25-09:50 **Gergely Maróti (Hungary):** Genome level investigation of inter-kingdom microbial interactions
- 🕒 09:50-10:15 **Elena Perrin (Italy):** Insights into the evolution of multipartite genomes in *Proteobacteria*
- 🕒 10:15-10:40 **Svetlana Ugarčina Perović (Italy) - online:** Challenges in metagenomic annotation of antibiotic resistome
- 🕒 10:40-10:55 **Marko Panić (Serbia, Offer. pres.):** Exploring *E. coli*-based expression of genetically inactivated tetanus toxin for vaccine development
- 🕒 10:55-11:10 **Allwin Mabes Raj (Slovenia, Offer. pres.):** Mer B (organomercurial-lyase) mediated quartz crystal microbalance (QCM) based methylmercury detection

🕒 11:40-11:55 COFFEE BREAK

📍 Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIA-2

ACTIVE IMMUNIZATION AS THE KEY ELEMENT IN INFECTION PREVENTION AND CONTROL (PART 3) - BACTERIAL VACCINES

Chaired by: Tamara Kastrin & Nataša Opavski

- 🕒 11:55-12:20 **Tamara Kastrin (Slovenia):** The importance of vaccination and national surveillance of invasive bacterial diseases and whooping cough in Slovenia
- 🕒 12:20-12:45 **Nataša Opavski (Serbia):** Do we need higher valency pneumococcal conjugate vaccines in Serbia?
- 🕒 12:45-13:10 **Marko Veljković (Serbia):** Vaccination against pertussis in Serbia: past, current challenges and future perspectives
- 🕒 13:10-13:35 **Nevena Jovičić (Serbia):** Complications of pneumococcal pneumonia in children
- 🕒 13:35-14:00 **Aleksandar Sovtić (Serbia):** Respiratory infections in children – over the horizon

 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIB-2


ENVIRONMENTAL MICROBIOLOGY AND BIOTECHNOLOGY (PART 3) - BIODETERIORATION OF MATERIALS: EXTREME ENVIRONMENTS & ANTIMICROBIAL RESISTANCE: A ONE HEALTH CHALLENGE

Chaired by: **Cecilia Flocco & Nikola Unković**

-  11:55-12:20 **Cecilia Flocco (Germany):** New perspectives for microbiology and biotechnology in cultural heritage research
-  12:20-12:45 **Nikola Unković (Serbia):** Research into the application of bacterial-based bioformulations in the conservation of fungal-deteriorated works of art in Serbia
-  12:45-13:10 **Nikolina Udiković Kolić (Croatia):** Environmental spread of antibiotic resistance – the role of industrial, agricultural and municipal waste
-  13:10-13:35 **Stoimir Kolarević (Serbia):** Impact of untreated wastewaters on the microbiological water quality of the Danube river and its tributaries in Serbia
-  13:35-14:00 **Dragana Predojević (Serbia):** Phytoplankton in small water bodies

 14:00-15:00 LUNCH BREAK






 Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

-  15:00-15:20 **Pfizer (INDUSTRY LECTURE) - Ivana Ćirković (Serbia):** Together in the fight against AMR, from immunization and diagnostics to targeted therapy

SESSION IIIA-2

ALTERNATIVE APPROACHES IN ANTIMICROBIAL CONTROL (PART 1) - BACTERIOPHAGES APPLICATIONS

Chaired by: **Mariagrazia Di Luca & Goran Vukotić**


-  15:20-15:45 **Mariagrazia Di Luca (Italy):** Unveiling the Janus-Face of Bacteriophages: A dual perspective on antibacterial therapy
-  15:45-16:10 **Hugo A. M. de Oliveira (Portugal):** Novel bacteriophage-based depolymerase strategies to control *A. baumannii*
-  16:10-16:35 **Goran Vukotić (Serbia):** Bacteriophages of multidrug-resistant nosocomial pathogens – Belgrade experience
-  16:35-17:00 **Luís D. R. de Melo (Portugal):** Phage-host interaction with cells in different metabolic states: *A. S. epidermidis* case
-  17:00-17:15 **Sonja Gostimirović (Serbia, Offer. pres.):** Non-tailed icosahedral phages as antibacterial agents

 Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor

SESSION IIIB-2

PANEL SESSION - INTRAHOSPITAL AND EMERGING INFECTIONS

Moderator: **Dušan Kekić**

-  15:20-17:15 **PANELISTS:**
Miodrag Milenović (Serbia)
Novica Nikolić (Serbia)
Jelena Jordović (Serbia)

PRESENTING CASES:

Marija Rajković (Serbia): Fulminant necrotizing fasciitis: A fatal outcome. Case series

Elena Đukić (Serbia): Unraveling the mystery: A case of septic shock with unknown origin

Ana Mirković (Serbia): A case report of *Staphylococcus aureus* prosthetic valve endocarditis in patient with Randu – Osler – Weber syndrome

Martina Jug (Serbia): Aspergillosis - diagnostic and therapeutic challenges

🕒 17:45-19:15 **POSTER VIEWING SESSION - HALL CLUB OF THE HOTEL PALACE, GROUND FLOOR, TOPLIČIN VENAC 23, BELGRADE**

📅 **Saturday, April 6, 2024**

🕒 08:30-09:30 **Registration of participants**

📍 **Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor**

SESSION IA-3

MICROBIAL GENETICS, METAGENOMICS AND METAPROTEOMICS (PART 3) - MICROBIOMES AND RECENT DEVELOPMENTS & MICROBIAL GENOMES AND THEIR EVOLUTION

Chaired by: **Tamara Janakiev & Alfonso Esposito**

- 🕒 09:30-09:55 **Nađa Nikolić (Serbia):** Microbiomes in oral carcinomas
- 🕒 09:55-10:20 **Alfonso Esposito (Italy):** Next-Generation Sequencing and Bioinformatics: How does microbiology benefit from cutting edge technologies?
- 🕒 10:20-10:45 **Tamara Janakiev (Serbia):** Plant microbiomes: from diversity to healthy crops
- 🕒 10:45-11:00 **Maurizio Zotti (Italy, Offer. pres.):** Microbiome associated with mycelial activity of three species of *Basidiomycetes*: Fairy rings in the gardens of the Royal Palace of Caserta (Italy)
- 🕒 11:00-11:15 **Daria Tsibulskaia (Serbia, Offer. pres.):** Description of a new potential aggregation factor from the *Streptococcus thermophilus* genome
- 🕒 11:15-11:40 **Jose Alexander (USA) - online:** Implementation of a rapid, cost-effective, and clinically focused NGS solution

📍 **Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor**

SESSION IB-3

HEALTH MICROBIOLOGY AND BIOTECHNOLOGY & ALTERNATIVE APPROACHES IN ANTIMICROBIAL CONTROL (PART 2)

Chaired by: **Lidija Đokić & Jon Salmanton-García**

- 🕒 09:30-09:55 **Marina Šantić (Croatia):** *Legionella pneumophila* - journey from the environment to human macrophages



- 🕒 09:55-10:20 **Jon Salmanton-García (Germany):** Overview on the current situation on epidemiology and management of IFI and future perspectives
- 🕒 10:20-10:45 **Ivana Čolović Čalovski (Serbia):** Diagnosis of intestinal helminth infections: strengths and limitations
- 🕒 10:45-11:10 **Eleonora Dubljanin (Serbia):** Biomarker guided antifungal therapy: a current state of laboratory mycology and antifungal management
- 🕒 11:10-11:35 **Lidija Đokić (Serbia):** New approaches in the treatment of chronic bacterial infections

🕒 11:40-12:10 **COFFEE BREAK**

📍 **Venue - Hall „DONJI DORČOL“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor**

SESSION IIA-3

ALTERNATIVE APPROACHES IN ANTIMICROBIAL CONTROL (PART 3) - BIOTECHNOLOGICAL APPROACH OF USING NATURAL PRODUCTS & NANOTECHNOLOGY IN MICROBIOLOGY

Chaired by: **Marina Soković & Ivana Gobin**

- 🕒 12:10-12:35 **Marina Soković (Serbia):** Microfungi as a target and source of valuable compounds
- 🕒 12:35-13:00 **Ivana Gobin (Croatia):** Biofilms in premise plumbing systems - current challenges and potential solutions
- 🕒 13:00-13:25 **Marina T. Milenković (Serbia):** Herbal products as an alternative to antibiotics: application possibilities and limitations
- 🕒 13:25-13:50 **Tatjana Stević (Serbia):** Biocontrol activity of plant products against plant pathogens
- 🕒 13:50-14:05 **Miroslav Dinić (Serbia, Offer. pres.):** Host-microbiota interplay regulates epithelial barrier function and wound healing

📍 **Venue - Hall „SCHONDA 4“ of the MONA PLAZA Hotel, Cara Uroša 62-64, First floor**

SESSION IIB-3

WORKSHOP “NEXT GENERATION SEQUENCING (NGS) IN MICROBIOLOGY “

Moderators: **Valentina Đorđević & Ivana Morić**

- 🕒 12:10-12:35 **Valentina Đorđević (Serbia):** Center for Genome Sequencing and Bioinformatics
- 🕒 12:35-13:00 **Ivana Morić (Serbia):** Introduction to NGS technologies
- 🕒 13:00-13:25 **Mirjana Novković (Serbia):** Genome sequence diversity of SARS-CoV-2 in Serbia during pandemic
- 🕒 13:25-13:55 **Nada Stanković & Ivana Galić (Serbia):** Metagenomic studies

🕒 14:15-14:30 **ORGANIZATIONAL CLOSING REMARKS**

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THE ROLE OF EFFLUX PUMPS IN TIGECYCLINE RESISTANCE OF *ACINETOBACTER BAUMANNII* ISOLATES FROM WESTERN BALKAN HOSPITALS

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The increasing prevalence of multidrug-resistant (MDR) *Acinetobacter baumannii* limits effective therapeutic options, and tigecycline has been considered one of the last resort therapies for MDR *A. baumannii* infections. Nevertheless, *A. baumannii* isolates resistant to tigecycline are becoming increasingly reported, mostly due to overexpression of efflux pumps. The three major RND efflux systems conferring tigecycline resistance in *A. baumannii* are AdeABC, AdeFGH, and AdeIJK, and their expression is regulated by the two-component system AdeRS, the LysR-type regulator AdeL, and the TetR-type regulator AdeN, respectively. Following the above, we aimed to determine the role of efflux pumps in tigecycline resistance of thirty-seven *A. baumannii* isolates collected from Western Balkan healthcare settings (Serbia, Bosnia and Herzegovina and Montenegro) in 2016 and 2022. The majority of isolates belonged to the most prevalent international clonal lineage IC2 (n = 32), four isolates are members of IC1, while only one isolate is iden-

tified as IC3. All tested isolates demonstrated a significant decrease in tigecycline MIC in presence of efflux pump inhibitor CCCP (≥ 16 -fold reduction) indicating that mechanism responsible for tigecycline resistance is antibiotic efflux. The comparison of target efflux pump regulatory proteins, translated from nucleotide sequences, to reference strains ATCC19606 and ATCC17978 revealed that most of the isolates have G186V and N268H alternations in AdeS (n = 32), while most common changes in AdeR were V120I and A136V (n = 29) as described in previous studies. Substitution Q262R was detected exclusively in AdeL proteins of IC1 isolates, while no mutations were observed within AdeN regulators. Expression of the *adeB*, *adeG*, and *adeJ* genes in six selected isolates was upregulated in four (1,4- to 3-fold), six (1,6- to 2,6-fold), and three isolates (1,7- to 4-fold), respectively. This study confirmed that overexpression of efflux pump encoding genes enables tigecycline resistance in clinical *A. baumannii* isolates.

KEYWORDS: *Acinetobacter baumannii*; RND efflux pumps; tigecycline resistance; AdeABC; AdeFGH

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