

Thursday, 18/09/2025

Registration & Light Lunch

11:00-12:00 CEST

Opening of SBMI 2025

12:00-12:10 CEST

Session I:

12:10-13:30 CEST

Chair: Yann Bachelot

12:10-12:50 CEST



Unveiling Host-Pathogen Interactions in Time and Space at Single-Cell Resolution

Emmanuel Saliba, University of Würzburg, Germany.

12:50-13:10 CEST



Pandemic preparedness: Individual-based modeling of day care centers predicts optimal surveillance strategies against pandemic viral diseases

Philipp Städter, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

13:10-13:30 CEST



A model of Rtc-regulated RNA repair reveals heterogeneous responses to ribosome-targeting antibiotics and suggests molecular targets to potentiate their effects

Hollie Hindley, University of Edinburgh, UK.

Coffee break

13:30-14:00 CEST

Session II:

14:00-15:40 CEST

Chair: Karoline Schied

14:00-14:40 CEST



Deterministic and Stochastic dynamics in Bacterial Persistence: Insights from Experiments and Minimal Models

Namiko Mitarai, University of Copenhagen, Denmark

14:40-15:10 CEST



Degradation of a plant defense metabolite by pathogenic *Pseudomonas* shapes the leaf microbiome and offers potential biocontrol strategies

Kerstin Unger & Marco Mauri, Friedrich Schiller University Jena, Jena, Germany.

Michael Reichelt, Jonathan Gershenzon, Rosalind J. Allen, Matthew T. Agler

15:10-15:40 CEST



The role of neutrophil-derived extracellular vesicles in promoting *Candida albicans* escape from phagocytosis

Anastasia Solomatina, Applied Systems Biology, Hans Knöll Institute, Jena, Germany.

Kerstin Hünninger-Ast, University of Würzburg, Institute for Hygiene and Microbiology, Würzburg & Fungal Septomics, Hans Knöll Institute, Jena, Germany

J. J. Patitz, N. E. Nieuwenhuizen, Y. Bachelot, A. K. Zimmermann, M. Blango, T. Krüger, O. Kniemeyer, A. A. Brakhage, O. Kurzai, M. T. Figge

Coffee break

15:40-16:10 CEST

Session III:

16:10-18:10 CEST

Chair: Parastoo Akbarimoghaddam

16:10-16:50 CEST



Physiological Heterogeneity and the Fate of Treatment: Single-Cell Insights into Bacterial Responses to Antibiotics and Phages

Somenath Bakshi, University of Cambridge, UK.

16:50-17:10 CEST



Viral lifecycle dynamics and spatial structure explain why pathogenicity is prophage-encoded

Sultan Ahmed Nazir, Utrecht University, Netherlands

Bram van Dijk

17:10-17:30 CEST



Function-specific epistasis alters otherwise repeatable evolutionary trajectories towards antibiotic resistance

Gabriela Petrunaro, Institute for biological physics, University of Cologne, Germany

Theresa Fink, Booshini Fernando, Gerrit Ansmann, Tobias Bollenbach

17:30-17:50 CEST



Bayesian mechanistic modelling of Candida auris optical density data to detect antifungal drug synergy

Tara Hameed, Imperial College London, UK

Larissa John, Elaine Bignell, Reiko J. Tanaka

17:50-18:10 CEST

Generative AI for Inverse Problems in Biomedical Computational Microscopy



Artur Yakimovich, Center for Advanced Systems Understanding, Helmholtz-Zentrum Dresden-Rossendorf e.V., Görlitz, Germany

Dinner

18:10-19:10 CEST

Poster Session

19:10-21:00 CEST

Most (tandem) talks will also be presented as posters.

Studying the Transition from Persister to Active Cells in Mycobacterium

Andreas Ulmer, Cluster of Excellence Balance of the Microverse, Friedrich Schiller University Jena, Jena, Germany

Vijay Srinivasan, Marco Mauri, Rosalind J. Allen,

Antibiotic exposure reveals differential susceptibility among human gut bacterial species

Pallabita Saha, Department of Microbiology, Immunology and Transplantation, Rega Institute, KU Leuven, Leuven, Belgium

Diversity and activity of microbial communities of the sea surface microlayer in the southern North Sea

Gurleen Singh, Carl von ossietzky universität oldenburg, Germany

Isha Athale, Thorsten Brinkhoff

Antidepressants can induce antibiotic resistance and persistence in the gut microbiome of patients with major depression

Johanna Wallnisch, Theoretical Microbial Ecology, Friedrich Schiller University Jena, Germany

Exploring the Spatial and Temporal Distribution of Biofilm Microbiomes on Endotracheal Tubes and their Role in Ventilator-Associated Pneumonia

Tia Wünschmann, Theoretical Microbial Ecology, Friedrich Schiller University Jena, Germany

Exploring the Functional Role of Bacterial Aggregation in the Human Gut Microbiota

Stefanie Wagner, Theoretical Microbial Ecology Group & Cluster of Excellence 'Balance of the Microverse', Friedrich Schiller University Jena, Germany

Anne Busch, Rosalind J. Allen

DY-635 as a Ligand for Nanoparticle Hepatocyte-Targeting via OATP Selectivity

Paul Andrew Lee, Department of Anaesthesiology and Intensive Care Medicine, Universitat Klinikum Jena, Germany; SmartDyeLivery GmbH, Jena, Germany

Walter Hauswald, Julia Greiser, Marta Pomraenke, Zoltán Cseresnyés, Marc Thilo Figge, Ruman Gerst, Adrian T. Press

Virtual Phagocytosis Assays Resolve Ambiguities in Traditional Phagocytosis Measurements

Jana Wilms, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Sandra Timme, Simranpreet Kaur, Mohamed Hassan, Zoltán Cseresnyés, Kerstin Voigt, Marc Thilo Figge,

Modeling *Candida albicans* complex-mediated evasion and in silico treatment strategies: a systems biology approach

Yann Bachelot, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Carl-Magnus Svensson, Josephine Schötz, Anastasia Solomatina, Kerstin Hünninger-Ast, Oliver Kurzai, Marc Thilo Figge

Agent-based modeling of Organ-on-Chip experiments

Karoline Schied, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

From Pixels to Insights: Image-based Analysis of Intestine-on-Chip Models

Parastoo Akbarimoghaddam, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Tim Kaden, Raquel Alonso-Roman, Manuel Allwang, Tobias Schaal, Johannes Stallhofer, Zoltan Cseresnyes, Mark S. Gresnigt, Bernhard Hube, Alexander S. Mosig, Marc Thilo Figge

Capturing Macromolecular Crowding effect in Biochemical Systems

Liliana Angeles-Martinez, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Marc Thilo Figge

High-Throughput Detection of Microbial Growth and Antibiotic Resistance using Scattered Light Imaging and Deep Learning

Arjun Sarkar, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Martina Graf, Carl-Magnus Svensson, Anne-Sophie Munser, Sven Schröder, Sundar Hengoju, Marc Thilo Figge, Miriam A. Rosenbaum

Quantitative Characterization of MoS₂-Coated Titanium Surfaces and Analysis of *S. aureus* Adherence Using JIPipe

Mounir Zerdani, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Bettina Löffler, Carl-Magnus Svensson, Andrey Turchanin, Christof Neumann, Rania Ennaciri, Marc Thilo Figge, Gaurvanshi Gupta

Hybrid Agent-Based Model of Human Alveolar Sac Predicts Intrinsic Behaviour of Innate Immune Response Against *Aspergillus fumigatus*

Simone Piccioni, Applied Systems Biology, Hans Knöll Institute, Jena, Germany

Immune response of the Monocytic Cell Line THP-1 against wild-type *Staphylococcus aureus* and small colony variants to monitor host-pathogen interaction

Sahar Hosseini Dehkordi, Theoretical Microbial Ecology/Bioinstrumentezentrum, Microbiology-Friedrich Schiller Universität Jena, Germany

Stefanie Wagner, Anne Busch, Elena Tiumina, Rosalind Allen

Type I interferons restrict *C. albicans* translocation through the intestinal epithelial barrier

Saloni Saloni & Beatriz Cristóvão, Adaptive Pathogenicity Strategies, Hans Knöll Institute, Jena, Germany

Özlem Kirav, Marina Pekmezović, Sascha Schäuble, Mark S. Gresnigt

Learning hierarchically structured viral abundances from metagenomics data improves prediction for host-associated disease classification

Daniele Pugno, Helmholtz Munich, Germany

DPO (3,5-dimethylpyrazin-2-ol)-dependent quorum sensing modulates biofilm behavior of *Vibrio cholerae* in a 3D-intestine-on-chip infection model

Adrian Feile, University Hospital Jena, Germany

Zoltan Cseresnyes, Applied Systems Biology, Hans Knöll Institute Jena, Germany

Elisabeth Urbauer, Annika König, Valentin Wegner, Kerstin Thriene, Marc T. Figge, Kai Papenfort, Alexander S. Mosig

Friday, 19/09/2025

Session IV:

09:00-10:20 CEST

Chair: Simone Piccioni

09:00-09:40 CEST



How does intermittent feeding shape the gut microbiome?

Florence Bansept, Aix-Marseille Université, France

09:40-10:00 CEST



Predicting Microbial Interactions Using Graph Neural Networks

Elham Gholamzadeh, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

Kajal Singla, Nico Scherf

10:00-10:20 CEST



Can Time-Dependent Optimal Interventions Effectively Reduce Microbial Pathogen Spread? A Case Study of Salmonella Transmission

Zubair Ahmad, University of Naples Federico II; University of Campania

“Luigi Vanvitelli”, Caserta, Italy

Francesco Giannino, Gerardo Toraldo

Coffee break

10:20-10:50 CEST

Session V:

10:50-12:40 CEST

Chair: Philipp Städter

10:50-11:30 CEST



Individual-based modelling of microbial interactions: examples and lessons learnt

Jan-Ulrich Kreft, Institute of Microbiology and Infection & School of Biosciences, University of Birmingham, UK

Bastiaan J. R. Cockx, Tim Foster, Robert J. Clegg, Barth F. Smets

11:30-12:00 CEST



DPO (3,5-dimethylpyrazin-2-ol)-dependent quorum sensing modulates biofilm behavior of *Vibrio cholerae* in a 3D-intestine-on-chip infection model

Adrian Feile, University Hospital Jena, Germany

Zoltan Cseresnyes, Applied Systems Biology, Hans Knöll Institute Jena, Germany

Elisabeth Urbauer, Annika König, Valentin Wegner, Kerstin Thriene, Marc T. Figge, Kai Papenfort, Alexander S. Mosig

12:00-12:20 CEST



Effect of efflux-pump activity, cell density and population composition on antibiotic accumulation in bacterial biofilms

Silvia Vareschi, Friedrich Schiller University Jena, Germany

Marco Mauri, Rosalind J. Allen

12:20-12:40 CEST



Statistical end-to-end analysis of large-scale microbial growth data with DGrowtH

Medina Feldl, Institute of Computational Biology, Helmholtz Munich, Germany

Roberto Olayo-Alarcon, Martin K. Amstalden, Annamaria Zannoni, Stefanie Peschel, Ana Rita Brochado, Cynthia M Sharma, Christian L. Müller

Lunch break

12:40-13:30 CEST

Session VI:

13:30-15:10 CEST

Chair: Jana Wilms

13:30-14:00 CEST

Deciphering immune adaptations of an opportunistic fungal pathogen



Axel Dietschmann & Candela Fernández-Fernández, Adaptive Pathogenicity Strategies, Hans Knöll Institute, Jena, Germany.

Sude Dinçer, Thomas Krüger, Sascha Schäuble, Fay Bruggeman, Maximilian Himmel, Salomé LeibundGut-Landmann, Frank L. van de Veerdonk, Olaf Kniemeyer, Gianni Panagiotou, Axel A. Brakhage, Mark S. Gresnigt

14:00-14:20 CEST



DAP10-engineered Af-CAR-NK cells exert enhanced antifungal activity against *A.fumigatus*.

Matteo Mauget, Medizinische Klinik und Poliklinik II und Lehrstuhl für Zelluläre Immuntherapie, Universitätsklinikum, Würzburg, Germany

Anna-Lena Schmitt, Hermann Einsele, Michael Hudecek, Jürgen Löffler, Michelle Seif

14:20-14:50 CEST



Response prediction of lipopolysaccharide challenged healthy subjects and NETosis dynamics

Carl-Magnus Svensson, *Applied Systems Biology, Hans-Knöll-Institute, Jena, Germany*

Friedemann Börner, Institute for Clinical Chemistry and Laboratory Diagnostics, Jena University Hospital, Jena, Germany

Adrian Press, Marc Thilo Figge

14:50-15:10 CEST



Bordetella pertussis Toxins Drive the Emergence of a Unique CD8⁺ T Cell Subset in the Respiratory Tract

Peter Sebo, Institute of Microbiology of the CAS, Prague, Czech Republic

Anna Kratochvilova, Jana Holubova, Ondrej Stepanek, Ondrej Stanek

Closing of SBMI 2025

15:10-15:20 CEST