Thursday, 21/09/2023

Registration & Light Lunch

11:00-12:00 CEST

Opening of SBMI 2023

12:00-12:10 CEST

Session I: Antibiotic Resistance

12:10-13:50 CEST

Chair: Carl-Magnus Svensson

12:10-12:50 CEST

Systems biology of the response of mycobacteria to the antibiotic rifampicin

Rosalind Allen, Friedrich Schiller University, Jena, Germany

12:50-13:20 CEST

Nanoscale Architecture of Bacteria Peptidoglycan: A Synergy of High Resolution Atomic Force Microscopy Imaging and Theoretical Modelling

Abimbola Feyisara Olulana, Marco Mauri & Sheila Hoshyaripour; The University of Sheffield, UK & Friedrich Schiller University, Jena, Germany

Olulana AF, Mauri M, Hoshyaripour S, Biboy J, Meacock O, Pasquina-Lemonche L, Durham WM, Owen D, Allen RJ, Foster SJ, Vollmer W, Hobbs JK

13:20-13:50 CEST

Stochastic Bacterial Response to Antibiotics in Multiplexed Picolitre Droplets

Nia Verdon & Ashkan Samimi; Friedrich Schiller University, Jena, Germany & Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Verdon N, Samimi A, Allen R, Rosenbaum MA

Coffee break

13:50-14:10 CEST

Session II: Lung infection

14:10-16:10 CEST

Chair: Sandra Timme

14:10-14:50 CEST

Mechanistic basis of the antifungal potency of the airway epithelium in health and disease

Margherita Bertuzzi, University of Manchester, UK

14:50-15:10 CEST

Computational agent-based modelling: Dynamics of early immune response against *Aspergillus fumigatus* lung infections

Christoph Saffer, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Saffer C

15:10-15:30 CEST

Ex vivo lung model for studying virus-induced premature cellular senescence

Stefanie Deinhardt-Emmer, Jena University Hospital, Jena, Germany

Deinhardt-Emmer S

15:30-15:50 CEST

Individual-based modelling of day care centers can predict optimal surveillance strategies against SARS-CoV-2

Philipp Städter, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Städter P

15:50-16:10 CEST

DNA damage induces a small RNA interfering with cell division in *Klebsiella pneumoniae*

Eric Ruhland; Friedrich Schiller University, Jena, Germany

Ruhland E, Fröhlich K, Gerst R, Figge MT

Coffee break

16:10-16:30 CEST

Session III: Inflammation and immune response

16:30-18:40 CEST

Chair: Yann Bachelot

16:30-17:10 CEST

Modeling the Role of Innate Immune Cells in Infections, Diseases and Injury

Angela Reynolds, Virginia Commonwealth University, Richmond, USA

17:10-17:30 CEST

Investigation of the prognostic value for metabolic and Raman spectroscopic erythrocyte profiling in sepsis

Dustin Beyer, Jena University Hospital, Jena, Germany & Friedrich Schiller University, Jena, Germany

Beyer D*, Svensson CM*, Gräler MH, Ramoji A, Figge MT, Press AT

17:30-17:50 CEST

How to survive in a sepsis patient: Survival strategies of gut bacteria after antibiotic treatment

Anne Busch, University Hospital Jena, Germany & Friedrich Schiller University, Jena, Germany

Busch A

17:50-18:10 CEST

Human p11-mediated re-direction of phagosomes to the recycling endosome-expulsion pathway by a fungal pathogen

Lei-Jie Jia, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Jia LJ, Rafiq M, Radosa L, Hortschansky P, Cseresnyés Z, Krüger T, Schmidt F, Heinekamp T, Straßburger M, Figge MT, Carvalho A. Kniemeyer O, Brakhage AA

18:10-18:40 CEST

Neutralization of the *Candida albicans* toxin, candidalysin, blocks epithelial damage and dampens inflammatory responses associated with vulvovaginal candidiasis immunopathogenesis

Paul Rudolph & Marisa Valentine; Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Valentine M, Rudolph P, Dietschmann A, Mogavero S, Tsavou A, Lee S, Priest EL, Zhurgenbayeva G, Timme S, Eggeling C, Allert S, Dolk E, Naglik JR, Figge MT, Gresnigt MS, Hube B

Dinner

18:40-19:30 CEST

Poster Session

19:30-21:00 CEST

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

Image-based analysis of *Candida albicans* infection in a gut-on-chip model

Parastoo Akbarimoghaddam, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Akbarimoghaddam P, Alonso-Roman R, Allwang M, Hoffmann B, Cseresnyés Z, Hube B, Mosig AS, Gresnigt MS, Figge MT

Spatial distancing: Investigation of a defense mechanism for pathogen immune evasion

Yann Bachelot, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Bachelot Y

Gut Microbiome Under pH Stress

Nick Cogan, Florida State University, Tallahassee, USA

Cogan N, Obaidullah S

How hosts and pathogens choose the strengths of defence and counter-defence. A game-theoretical view

Shalu Dwivedi, Friedrich Schiller University Jena, Germany

Dwivedi S, Garde R, Schuster S

Towards automated quantification of viral and bacterial co-infections in an alveolus-on-chip model

Bianca Hoffmann, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Hoffmann B, Gauthier L, Koceva H, Mosig A, Ehrhardt C, Eggeling C, Figge MT

Microfluidic mother-machine device for bacterial cultivations under changing environmental conditions

Eugen Kaganovitch, Humboldt University of Berlin, Germany

Kaganovitch E

A Deep Learning approach for detecting single division events of bacteria in microfluidic droplets imaged by angle-resolved scattered light imaging

Arjun Sarkar, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Sarkar A, Graf M, Svensson CM, Munser AS, Figge MT

Deep learning-based characterization of neutrophil activation phenotypes in *ex vivo* human *Candida* blood infections

Arjun Sarkar & Jan-Philipp Praetorius, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Sarkar A, Praetorius JP, Figge MT

The Microverse of the Plastisphere

Kerstin Thriene, Friedrich Schiller University Jena, Germany

Huang Y, Sathe RRM, Thriene K, Hellmich UA, Papenfort K, Stallforth P

Rifampicin tolerance and growth fitness among isoniazid-resistant clinical *Mycobacterium tuberculosis* isolates: an *in-vitro* longitudinal study

Srinivasan Vijay, Friedrich Schiller University Jena, Germany

Vijay S, Bao NLH, Vinh DN, Nhat LTH, Thu DDA, Quang NL, Trieu LPT, Nhung HN, Ha VTN, Thai PVK, Ha DTM, Lan NH, Caws M, Thwaites GE, Javid B, Thuong NTT

Bacterial aggregation in a disbalanced human gut induced by antibiotics

Stefanie Wagner, Friedrich Schiller University Jena, Germany

Wagner S, Busch A, Allen R, Bauer M

Quantification of fungal growth patterns by tracking of hyphal structures in JIPipe

Mounir Zerdani, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Zerdani M

Friday, 22/09/2023

Session IV: Microbial interactions I

09:00-10:50 CEST

Chair: Christoph Saffer

09:00-09:40 CEST

Mechanisms of biofilm community assembly and functions

Knut Drescher, University of Basel, Switzerland

09:40-10:10 CEST

Modelling the dynamics of *Salmonella* infection in the gut at the bacterial and host levels

Coralie Muller, Pablo Ugalde-Salas; Inria Centre at the University of Bordeaux, France

Muller C, Ugalde-Salas P, Wortsman A, Kaempfer R, Frioux C, Labarthe S

10:10-10:30 CEST

Tracking the Dynamics of Interacting Microbial Populations

Joel Ching Kuma Mbanghanih, Friedrich Schiller University, Jena, Germany

Ching Kuma Mbanghanih J, Verdon N, Zander A, Malycheva T, Herbst R, Schuster S, Stallforth P, Allen RJ

10:30-10:50 CEST

Understanding polymicrobial urinary tract infections: from retrospective data analysis, through catheter biofilms, to bladder microtissue models

Ashim Kumar Dubey, Global Health Institute, School of Life Sciences, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

Dubey AK, Tomasek K, Egli A, Drescher K, McKinney J

Coffee break

10:50-11:10 CEST

Session V: Microbial interactions II

11:10-12:40 CEST

Chair: Paul Rudolph

11:10-11:50 CEST

Microbe-microbe interactions for vaccine decision making; examples from RSV and pneumococcal vaccination

Stefan Flasche, London School of Hygiene & Tropical Medicine, UK

11:50-12:10 CEST

Genetic and functional characterization of various *Debaryomyces hansenii* strains

Nadja Thielemann, Institute for Hygiene and Microbiology, Julius-Maximilians-University Würzburg, Germany

Thielemann N, Schöninger A, Reus N, Behr IS, Aldejohann AM, Kurzai O, Martin R

12:10-12:40 CEST

Unraveling the Complex Interplay between *Acinetobacter baumannii* and *Staphylococcus aureus* in Co-infections

Lorena Tuchscherr & Sandra Timme; University Hospital Jena, Germany & Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Timme S, Tuchscherr L, Wendler S, Figge MT

Lunch break

12:40-13:20 CEST

Session VI: Model selection and parameter estimation

13:20-15:20 CEST

Chair: Philipp Städter

13:20-14:00 CEST

Model-based analysis of immunity across scales

Jan Hasenauer, University of Bonn, Germany

14:00-14:20 CEST

Inferring fungal growth rates from optical density data

Tara Hameed, Imperial College London, London, UK

Hameed T, Motsi N, Bignell E, Tanaka RJ

14:20-14:40 CEST

Using resource allocation minimal model to study Crabtree- and WarburQ-effects in fungi

Wassili Dimitriew, Friedrich Schiller University, Jena, Germany

Dimitriew W, Ewald J, He Z, Schuster S

14:40-15:00 CEST

Intracellular "*in silico* microscopes" – fully 3D spatio-temporal virus replication model simulations

Markus M. Knodel, Simulation in Technology, TechSim, Germany

Knodel MM, Nägel A, Herrmann E, Wittum G

15:00-15:20 CEST

Theory-informed experimental design for model identifiability: what needs to be measured?

Anastasia Solomatina, Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Jena, Germany

Solomatina A

Closing of SBMI 2023

15:20-15:30 CEST