

IbSB-10

Research Group Applied Systems Biology

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LEIBNIZ IZI-HKI

Research Group Applied Systems Biology

Head: Marc Thilo Figge

Development of Open-Source Software

- AMIT (Algorithm for migration and interaction tracking)
- MISA++ (High-performance image analysis in C++)
- JIP/JIPipe (Visual programming of image analysis pipelines)

QUANTITATIVE CHARACTERIZATION

- ACAO3 (Quantification of confrontation assays)
- Migration and interaction tracking

IMAGE ANALYSIS

- Machine and Deep Learning (Diagnosis of fungal-infected tissue sections by machine learning)
- Classical Image Analysis (Host-pathogen confrontation assays, Visualization and analysis of organ-on-chip experiments)
- Analysis of Novel Imaging Modalities (Multiphoton microscopy, Whole-organ imaging by light sheet microscopy, Angle-resolved light scattering of microfluidic droplets)

COMPUTER MODELS

- Differential Equation Models (Dynamics of the complement system)
- State-Based Models (Virtual whole-blood model for *C. albicans* blood stream infection, Simulation of COVID-19 hygiene concepts in kindergartens)
- Agent-Based Models (Virtual whole-blood model with *C. albicans*, Virtual alveolus model with *A. fumigatus*)

Internal collaboration partners:

- Prof. A. Brakhage, Molecular and Applied Microbiology
- Prof. D. Kurzai, Fungal Septomics
- Prof. M. von Lilienfeld-Toal, Infection Biology
- Prof. M. Ager-Rozenbaum, Bio-Pilot Plant

External collaboration partners:

- Prof. M. Günzer, Experimental Immunology and Infection Biology
- Dr. Schröder, Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Jena
- Prof. P. Zippel, Infection Biology
- Prof. O. Kurzai, Fungal Septomics
- Prof. J. Lisse, Paediatric Infectious Diseases and Immunology, University Hospital Würzburg

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BALANCE OF THE MICROVERSE Networks of interaction | Collaborative Research Center | Transregio

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InfectoGnostics Preclinical Gnotobiosis

InfectoOptics