

# IbSB-9

## Leibniz ScienceCampus InfectoOptics - Combating infectious diseases with advanced optical methods

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01/10/2021

The poster provides a detailed overview of the Leibniz ScienceCampus InfectoOptics project, structured into two main phases: Identification Phase (2015-2019) and Consolidation Phase (2020-2024).

**Background:** The Leibniz ScienceCampus InfectoOptics is a collaborative research project of the Leibniz Institutes HKI and IPHT, Jena and other extra university research institutions. Researchers from life sciences and optics/photonics work together with the aim of investigating and combating infectious diseases by means of novel optical techniques.

**Core Projects:**

- FastDrop (IPHT, HKI)**: Fiber-based droplet analysis of microorganisms.
- Intrafif (IPHT)**: Non-invasive photonics deciphering of complex polymicrobial infections in real-time.
- NISUS (IPHT)**: Nanoscale imaging of subcellular structures with KUV light.
- B-TWELVE (IPHT)**: Microvane remodeled B12 vitamins in action.
- Lipstaph (IPHT)**: Role of lipid transfer from host cells to S. aureus during chronic infection and its relevance for host immune response.
- Light into Darkness (IPHT)**: Response of the plankton microbiome to targeted unnatural illumination.
- DarkMicro (IPHT)**: Exploring microbial dark matter with picoliter droplets.

**Start-up projects:**

- FATDROP**: Fast fiber-based droplet analysis of microorganisms.
- INTRAFIF**: Non-invasive photonics deciphering of complex polymicrobial infections in real-time.
- NISUS**: Nanoscale imaging of subcellular structures with KUV light.
- B-TWELVE**: Microvane remodeled B12 vitamins in action.
- Light into Darkness**: Response of the plankton microbiome to targeted unnatural illumination.
- DarkMicro**: Exploring microbial dark matter with picoliter droplets.

**Publications:**

- Kulesa et al. 2019. PNAS 116(46): 22913-22918.
- Diedrich et al. 2019. PNAS 116(46): 22919-22924.
- Sommer et al. 2019. Small 15(43): 1-14.
- Arend et al. 2019. Antimicrob Agents Chemother 63(10): e00568.
- Diedrich et al. 2020. Antimicrob Agents Chemother 64(2): e025012.
- Houhou et al. 2020. Opt Express 28: 21002-21024.
- d'Ercole et al. 2021. PLoS Microbiol Rev 45(2): e1010600.

**Partners:**

- Leibniz Institute for Photonic納米技术 (IPHT)
- Leibniz Institute for Natural Product Research and Infection Biology (HKI)
- Fraunhofer Institute for Applied Optics and Precision Engineering (IOF)
- University of Jena
- University of Applied Sciences Jena
- University of Kassel

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