Department of Infectious Diseases

Major Infectious Diseases

DEPARTMENT OF INFECTIOUS DISEASES, HEIDELBERG UNIVERSITY

Research Groups of the Department of Infectious Diseases

Infectious Diseases - A Brief Description

Although infectious diseases have been known for thousands of years, the understanding of their source emerged only in the past century. Thus, the study of infectious diseases at the molecular and cellular level is a rather new research area, whose origin as an independent scientific discipline can be traced back to the discovery of pathogenic microorganisms in the 19th century.

Today it is common knowledge that infectious diseases are caused by bacteria, viruses, fungi and parasites. Although a lot has been learned about human pathogens in the past decades, infectious diseases continue to be a major threat for human health. Not only well known diseases like malaria, AIDS or chronic hepatitis, but also gastrointestinal or respiratory infections result in millions of deaths each year. Rapid evolution of pathogens and a changing environment result in rising threats from multiresistant bacteria or the emergence and spread of pathogens including novel strains of influenza virus, SARS or Dengue virus. Furthermore, advances in medicine have led to an increased number of immunocompromised people who are particularly susceptible to infectious diseases.

Apart from their enormous medical importance, microbes are also important model systems for molecular and cell biology. For example, RNA splicing was discovered in adenoviruses, oncogenes were found for the first time in retroviruses and the structure of nucleosomes was described initially for DNA viruses.

Current infectious disease research is a highly interdisciplinary topic at the interface between medicine and molecular, cell and structural biology. The Major "Infectious Diseases" within the MSc "Molecular Biosciences" offers the opportunity to study this topic in considerable depth, both in theory and in practice.

Research at the Department of Infectious Diseases

Main research topics of the Department include HIV/Aids, malaria, viral hepatitis and the interaction between pathogens and their host (immunology of infection, pathogen spread) (https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/zentrum-fuer-infektiologie). Researchers from all units are integrated within the new Center for Integrative Infectious Disease Research, where replication and spread of pathogens is studied in systems of increasing complexity, from molecular detail to interaction with the host immune response in 3D culture systems or animal models. Interactions are further strengthened by the new CIID building (INF 344) opened in November 2017, which houses many groups from the Department of Infectious Diseases and offers state of the art equipment, in particular an Infectious Disease Imaging Platform (https://www.idip-heidelberg.org/) for imaging of pathogens by a broad spectrum of advanced methods.

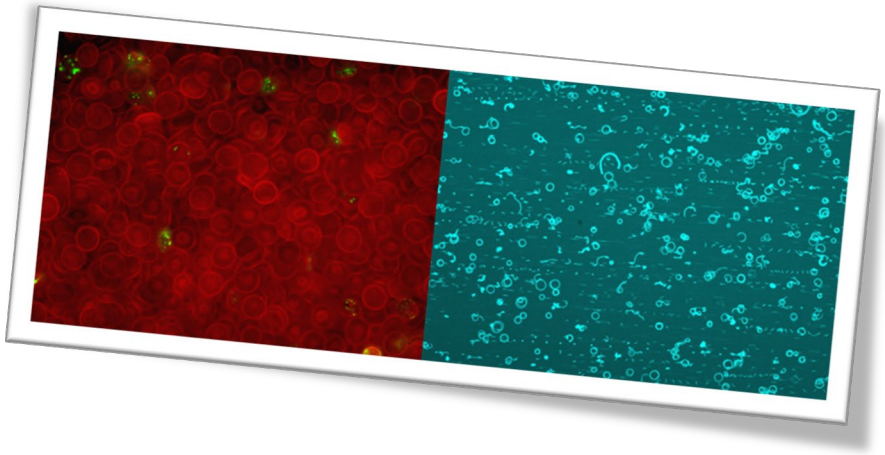
Beyond that, all research groups of the department are connected within local and international research consortia and networks, some of which are coordinated by members of the department. This comprises the Cluster of Excellence "CellNetworks" (http://www.cellnetworks.uni-hd.de/), the German Center for Infection Research "DZIF" (http://www.dzif.de/) as well as DFG collaborative research centers:
SFB1129 (http://www.sfb1129.de/),
TRR179 (www.trr179.de),
TRR83 (http://www.trr83.de/)
TRR319 (https://rmap.uni-mainz.de/),
TRR186 (https://trr186.uni-heidelberg.de/)
and the DFG priority program 1923 (https://spp1923.de/).

We cooperate with numerous institutions from Heidelberg University, the European Laboratory for Molecular Biology (EMBL), the German Cancer Research Center (DKFZ) and the Max-Planck-Institute for Medical Research, as well as with international partners. Our research activities are strengthened in particular by close interdisciplinary collaboration with scientists from the fields of physics, chemical biology, proteome and transcriptome analysis, cryo-electron microscopy, image analysis and scientific modelling.

More information on the research activities of the members of the Department of Infectious Diseases and the associated research groups participating in this Major can be found in the profiles provided below and on the corresponding websites.

Content and Structure of the Major Infectious Diseases

The Major "Infectious Diseases" is intended for students with a good basic knowledge of molecular and cell biology who wish to put their main focus on infectious disease pathogens. In the context of the Major they will deepen their knowledge of the basics of molecular and cell biology and get to know specific aspects of the replication of infectious pathogens and their interactions with their hosts. The participating departments and research groups offer internationally renowned research programs as well as an excellent infrastructure and they are very well connected with other research institutions inside and outside the university. Therefore, they offer ideal conditions for the Major "Infectious Diseases".



Criteria for admission

We welcome appropriately qualified students from all over the world to this course. Since modern infectious disease research focuses on molecular mechanisms of pathogenesis, a good basic knowledge of molecular and cell biology is a prerequisite for admission. Some prior knowledge of infectious disease biology and immunology is also helpful, but not mandatory. Students in the Heidelberg Bachelor courses "Biology" and "Molecular and Cellular Biology" who are interested in this Major are advised to attend the lectures and courses on microbiology, infectious disease immunology, parasitology and virology in Semesters 4 and 5.

Acquired Degree

With the successful completion of the course the student acquires the MSc in Biology with the specialization (Major) "Infectious Diseases". This Master's degree qualifies students to enter PhD programs in Europe or could be a starting point for a career in the pharmaceutical industry or a biotech company.

Various doctoral study programs are offered by the institutes involved in the "Infectious Diseases" Major. Further information is to be found on the websites of the participating departments. Students who are particularly keen to pursue a doctoral degree, and who have sufficiently high grades, may transfer to a doctoral program already after three semesters of Masters studies.

CONTACT POINT

Major Infectious Diseases

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https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/molecular-virology/major-infectious-diseases

Education at the Department of Infectious Diseases

The Department of Infectious Diseases at the Medical Faculty of Heidelberg represents the subject of Infectious Diseases in research, education and diagnostics, in the fields of bacteriology, virology, parasitology and tropical medicine. There are five units with a large number of research groups, most of which are involved in the educational activities of this Major. These units are:

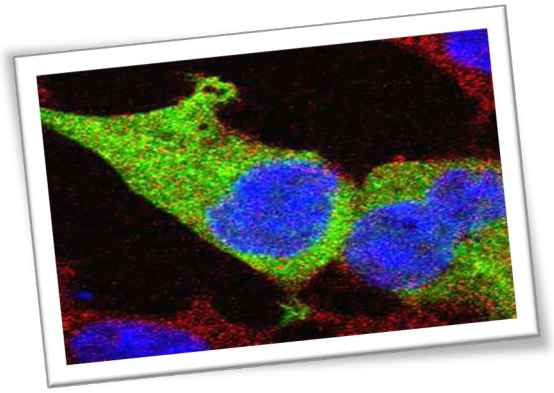
- Medical Microbiology and Hygiene
- Molecular Virology
- Virology
- Integrative Virology
- Parasitology

Medical Microbiology

Fields of Interest

Teams in the Medical Microbiology and Hygiene unit work in the field of Infection & Immunity. Specifically, we are interested to understand how host immunity reacts towards the contact with invading pathogens. A focus over the last years has been innate immunity which comprises the first line of defense against pathogenic microorganisms. Groups within the research unit study the biology of macrophages and dendritic cells which first encounter microbes. Moreover, frontline immunity at mucosal surfaces is analyzed. As the immune system is organized as a cellular network, communication between cells is of crucial importance. Therefore the research unit has a deep interest in signal transduction.

While classical bacteriology focuses on virulence factors and pathogenicity principles it is nowadays obvious that altered immune responses are equally important for infection susceptibility. The research unit analyzes the complex interplay of bacteria and immune cells thereby paving new roads for understanding current problems in infection defense, including sepsis, opportunistic infections in immunocompromised hosts and multi-resistant bacteria.



In order to address these topics we are using a multitude of methods and experimental approaches covering the fields of immunology, microbiology, molecular and cell biology as well as biochemistry.

The following teams belong to Medical Microbiology:

-Prof. Dr. med. Alexander Dalpke (Head of the Medical Microbiology)

-apl. Prof. Dr. Katharina Hieke-Kubatzky

Prof. Dr. Alexander Dalpke

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Scientific Vita

2019-2022: Full Professor (W3) for Medical Microbiology; Medical Director, Institute of Medical Microbiology and Virology; Medical Faculty, Technical University Dresden

2013-2018: Deputy Medical Director, Medical Microbiology and Hygiene, Dept. of Infectious Diseases, Heidelberg University

2011: Consultant Microbiologist

2006: Consultant Immunologist (DGfI)

2006-2018: Professor (W3) for Medical Microbiology and Infection and Immunity, Dept. of Medical Microbiology and Hygiene, University Heidelberg

Since 2005: Independent Group Leader, Dept. of Hygiene and Med. Microbiology, Heidelberg

2004: Venia legendi, Habilitation; University lecturer for infection and immunity, Med. Faculty, Philipps-University Marburg

1999-2004: PostDoc and Research Assistant, Inst. of Medical Microbiology, Philipps-University Marburg

1999: License to practice medicine

1998: MD in Medical Microbiology, University Göttingen (summa cum laude)

1992-1998: Human Medicine, University Göttingen

Specific Research Interests

- Immunostimulation by nucleic acids
- Microbiome analysis in cystic fibrosis

Selected Publications

Kolbe U, Yi B, Poth T, Saunders A, Boutin S and Dalpke A: Early cytokine induction upon Pseudomonas aeruginosa infection in murine precision cut lung slices depends on sensing of bacterial viability. **Front Immunol 2020**; 11: 598636

Boutin S, Graeber SY, Stahl M, Dittrich SA, Mall MA and Dalpke AH: Chronic but not intermittent infection with *Pseudomonas aeruginosa* is associated with global changes of the lung microbiome in cystic fibrosis. **Eur Respir J 2017**; 50(4): 1701086

Eigenbrod T, Pelka K, Latz E, Kreikemeyer B and Dalpke AH: TLR8 Senses Bacterial RNA in Human Monocytes and Plays a Nonredundant Role for Recognition of Streptococcus pyogenes. **J Immunol. 2015**; 195(3): 1092-1099

Weitnauer M, Schmidt L, Ng Kuet Leong N, Muenchau S, Lasitschka F, Eckstein V, Hübner S, Tuckermann J and Dalpke AH: Bronchial epithelial cells induce alternatively activated dendritic cells dependent on glucocorticoid receptor signaling. **J Immunol 2014;** 193(3): 1475-84

Hidmark A, von Saint Paul A and Dalpke AH: Cutting Edge: TLR13 is a receptor for bacterial RNA. **J Immunol 2012;** 189(6): 2717-21

Gehrig S, Eberle ME, Botschen F, Rimbach K, Eberle F, Eigenbrod T, Kaiser S, Holmes WM, Erdmann VA, Sprinzl M, Bec G, Keith G, Dalpke AH* and Helm M*: Identification of modifications in microbial, native tRNA that suppress immunostimulatory activity. **J Exp Med 2012;** 209(2): 225-233

Strebovsky J, Walker P, Lang R .and Dalpke AH: Suppressor of cytokine signaling 1 (SOCS1) limits NFκB signaling by decreasing p65 stability within the cell nucleus. **FASEB J 2011;** 25(3): 863-874

Schmidt LM, Belvisi MG, Bode KA, Bauer J, Schmidt C, Suchy MT, Tsikas D, Scheuerer J, Lasitschka F, Gröne HJ and Dalpke AH: Bronchial epithelial cell-derived prostaglandin E2 dampens the reactivity of dendritic cells. **J Immunol. 2011;** 186(4): 2095-2105

Baetz A, Koelsche C, Strebovsky J, Heeg K and Dalpke AH: Identification of a nuclear localization signal in suppressor of cytokine signaling 1 (SOCS1). **FASEB J 2008;** 22(12): 4296-4305

Bätz A, Frey M, Heeg K and Dalpke AH: Suppressor of cytokine signaling (SOCS) proteins indirectly regulate Toll-like receptor signaling in innate immune cells. **J Biol Chem 2004;** 279(52): 54708-54715

apl. Prof. Dr. Katharina Hieke-Kubatzky

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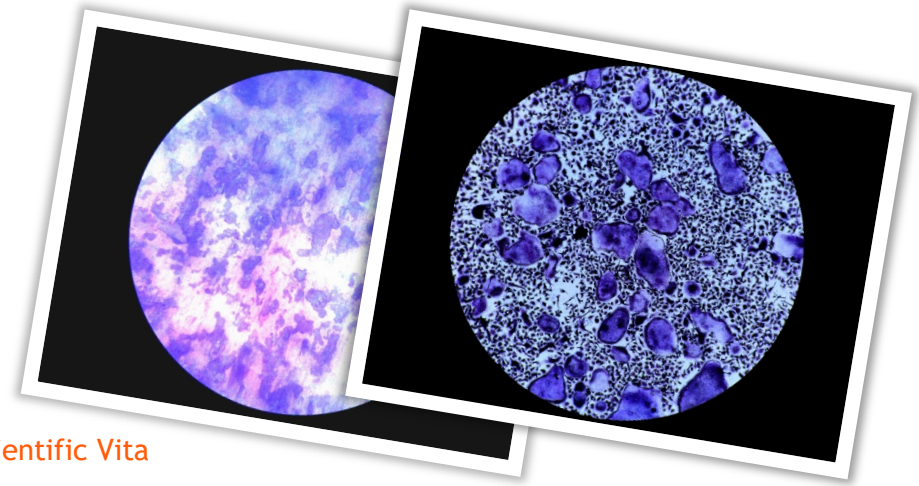


Scientific Vita

2018: Professorship (apl.) at Heidelberg University

2012: Habilitation in "Molecular Medicine" at the University of Heidelberg

2008: Max Kade Grant for a research year at the University of Michigan, Ann Arbor, USA

2005-2006: Junior Group Leader at the University of Freiburg, Institute of Experimental and Clinical Pharmacology and Toxicology

2002-2004: Postdoctoral Fellow at the Ludwig Institute for Cancer Research, Brussels, Belgium

2001-2002: Researcher at Alantos Pharmaceuticals, Heidelberg

1997-2000: PhD Thesis at the Max Planck Institute for Immunobiology, Freiburg

1992-1997: Studies in Chemistry at the University of Freiburg

Specific Research Interests

- Osteoimmunology: interactions between bone and immune cells
- Immune-metabolism and osteoclast differentiation: We investigate the ability of metabolic enzymes to modulate the plasticity of macrophages and their ability to become osteoclasts
- Staphylococci in bone infection: we aim to understand the crosstalk between bacteria and immune cells/osteoclasts
- Plumbagin-mediated effects on bone cells: This phytochemical is a potent ROS inducer with (anti)osteoclastic properties

Selected Publications

Sultanli S, Ghumnani S, Ashma R, Kubatzky KF: Plumbagin, a Biomolecule with (Anti)Osteoclastic Properties. **Int J Mol Sci 2021;** 22(5):2779

Lemke C, Benýšek J, Brajtenbach D, Breuer C, Jílková A, Horn M, Buša M, Ulrychová L, Illies A, Kubatzky KF, Bartz U, Mareš M, Gütschow M: An Activity-Based Probe for Cathepsin K Imaging with Excellent Potency and Selectivity. **J Med Chem 2021;** 64(18):13793-13806

Seebach E, Kubatzky KF: Chronic Implant-Related Bone Infections-Can Immune Modulation be a Therapeutic Strategy? **Front Immunol 2019;** 10:1724

Nair A, Chauhan P, Saha B, Kubatzky KF: Conceptual Evolution of Cell Signaling. **Int J Mol Sci 2019;** 20(13):3292

Kubatzky KF, Uhle F, Eigenbrod T: From macrophage to osteoclast – How metabolism determines function and activity. **Cytokine. 2018;** 112:102-115

Chakraborty S, Kloos B, Harre U, Schett G, Kubatzky KF: Pasteurella multocida Toxin Triggers RANKL-independent Osteoclastogenesis. **Front Immunol 2017;** 8:185

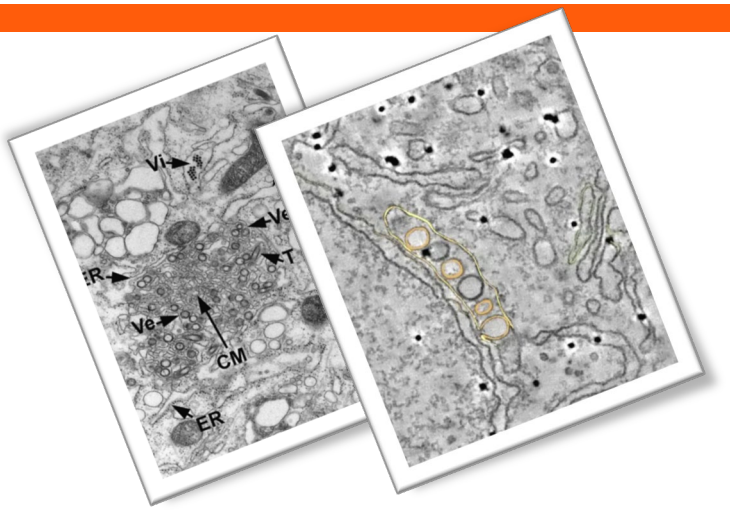
Hildebrand D, Heeg K, Kubatzky KF: Pasteurella multocida Toxin Manipulates T Cell Differentiation. **Front Microbiol 2015;** Nov 19; 6:1273

Kloos B, Chakraborty S, Lindner SG, Noack K, Harre U, Schett G, Krämer OH, Kubatzky KF: Pasteurella multocida Toxin induced osteoclastogenesis requires mTOR activation. **Cell Commun Signal 2015;** Sep 14; 13:40

Wiedenmann T, Ehrhardt S, Cerny D, Hildebrand D, Klein S, Heeg K, Kubatzky KF: Erythropoietin acts as an anti-inflammatory signal on murine mast cells. **Mol Immunol 2015;** 65(1): 68-76

Hildebrand D, Bode KA, Rieß D, Cerny D, Waldhuber A, Römmler F, Strack J, Korten S, Orth JH, Miethke T, Heeg K, Kubatzky KF: Granzyme A produces bioactive IL-1b through a non-apoptotic inflammasome-independent pathway. **Cell Rep 2014;** 6;9(3): 910-7

Molecular Virology



Fields of Interest

Teams in the department Molecular Virology work on several highly important human pathogens, namely hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV) and several flaviviruses, most notably Dengue virus (DENV), Zikavirus (ZIKV) and, most recently, coronaviruses such as SARS-CoV-2. These viruses are leading causes for death worldwide with about 400 million people suffering from a chronic infection with HBV/HDV or HCV and about 400 million new DENV infections occurring each year, especially in tropical countries. Moreover, the recent pandemic spread of ZIKV underscores the medical relevance of this virus family.

As a department that focuses on the molecular and cell biology of these infections, the following topics are studied: virus-host cell interactions, mechanism of host cell infection, morphology, biogenesis and dynamics of viral replication factories, virus assembly and involved host cell factors, viral and cellular factors and their suitability for (broad-spectrum) antiviral therapy, RNA structures and their role for viral replication, mathematical modeling and simulation of virus replication and interaction with innate immune responses, virus-induced host cell alterations, host cell stress response to virus infection, innate immune response and viral counter measures, antiviral therapy and therapy resistance and development of viral diagnostics and antiviral drugs. In order to cover these topics, we are using a broad and diverse array of methods and experimental approaches covering the fields of molecular biology, cell biology, biochemistry and immunology. In addition to state-of-the-art methods in these fields we use live cell imaging, cutting edge light and electron microscopy as well as 3D reconstructions.
The following teams belong to Molecular Virology:

-Prof. Dr. Ralf Bartenschlager (Head of the Molecular Virology)

-Prof. Dr. Stephan Urban (DZIF Professorship for Translational Virology)

-apl. Prof. Dr. Volker Lohmann (Head of Section „Virus Host Interactions")

-Dr. Alessia Ruggieri

Prof. Dr. Dr. h.c. Ralf Bartenschlager

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Web: www.molecular-virology.uni-hd.de

Scientific Vita

2002-present: Full Professor and head of Department of Infectious Diseases, Molecular Virology, Heidelberg University, Germany; CHS Stiftungsprofessur "Molekulare Virologie"

2001: Full Professor for Molecular Biology, University of Mainz

1999: Habilitation, University of Mainz

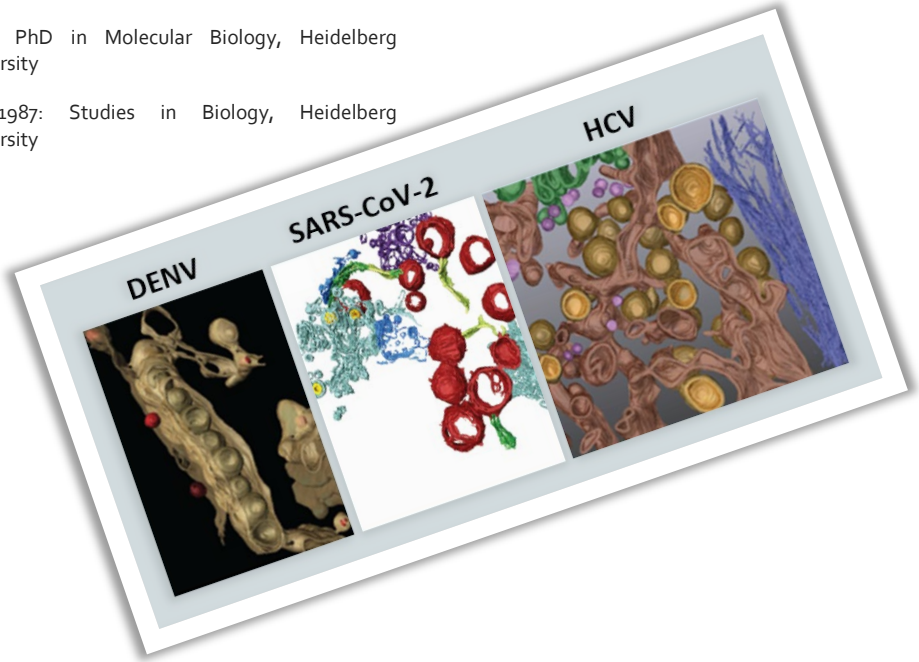
1991-1993: PostDoc, Central Research Unit, Hoffmann-La Roche AG, Basel, Switzerland

1990: PhD in Molecular Biology, Heidelberg University

1981-1987: Studies in Biology, Heidelberg University

Specific Research Interests

- Virus - host cell interaction (HBV, HCV, DENV, ZIKV and SARS-CoV-2)
- Structural and functional aspects of viral RNA replication and assembly
- Viral and host targets for antiviral therapy
- Innate immune responses and viral countermeasures
- Strategies of viral persistence



Selected Publications

Ke Z, Oton J, Qu K, Cortese M, Zila V, McKeane L, Nakane T, Zivanov J, Neufeldt CJ, Cerikan B, Lu JM, Peukes J, Xiong X, Kräusslich HG, Scheres SHW, Bartenschlager R, Briggs JAG: Structures and distributions of SARS-CoV-2 spike proteins on intact virions. **Nature 2020**; doi: 10.1038/s41586-020-2665-2 Epub ahead of print. PMID: 32805734

Neufeldt CJ, Cortese M, Scaturro P, Cerikan B, Wideman JG, Tabata K, Moraes T, Oleksiuk O, Pichlmair A, Bartenschlager R: ER-shaping atlastin proteins act as central hubs to promote flavivirus replication and virion assembly. **Nat Microbiol. 2019**; (12):2416-2429

Lauber C, Seitz S, Mattei S, Suh A, Beck J, Herstein J, Börold J, Salzburger W, Kaderali L, Briggs JAG, Bartenschlager R: Deciphering the Origin and Evolution of Hepatitis B Viruses by Means of a Family of Non-enveloped Fish Viruses. **Cell Host Microbe 2017**; 22(3):387-399

Chatel-Chaix L, Cortese M, Romero-Brey I, Bender S, Neufeldt CJ, Fischl W, Scaturro P, Schieber N, Schwab Y, Fischer B, Ruggieri A, Bartenschlager R: Dengue Virus Perturbs Mitochondrial Morphodynamics to Dampen Innate Immune Responses. **Cell Host Microbe 2016**; 20(3):342-56

Seitz S, Iancu C, Volz T, Mier W, Dandri M, Urban S, Bartenschlager R: A Slow Maturation Process Renders Hepatitis B Virus Infectious. **Cell Host Microbe 2016**; 20(1):25-35

Romero-Brey I, Merz A, Chiramel A, Lee JY, Chlanda P, Haselman U, Santarella-Mellwig R, Habermann A, Hoppe S, Kallis S, Walther P, Antony C, Krijnse-Locker J, Bartenschlager R: Three-dimensional architecture and biogenesis of membrane structures associated with hepatitis C virus replication. **PLoS Pathog 2012**; 8(12)

Welsch S, Miller S, Romero-Brey I, Merz A, Bleck CK, Walther P, Fuller SD, Antony C, Krijnse-Locker J, Bartenschlager R: Composition and three-dimensional architecture of the dengue virus replication and assembly sites. **Cell Host Microbe 2009**; 5(4): 365-75

Meylan E, Curran J, Hofmann K, Moradpour D, Binder M, Bartenschlager R, Tschopp J: Cardif is an adaptor protein in the RIG-I antiviral pathway and is targeted by hepatitis C virus. **Nature 2005**; 437(7062): 1167-72

Wakita T*, Pietschmann T*, Kato T, Date T, Miyamoto M, Zhao Z, Murthy K, Habermann A, Kräusslich HG, Mizokami M, Bartenschlager R*, Liang TJ. (* equal contribution): Production of infectious hepatitis C virus in tissue culture from a cloned viral genome**. Nat Med 2005**; 11(7): 791-6

Lohmann V, Körner F, Koch J, Herian U, Theilmann L, Bartenschlager R: Replication of subgenomic HCV RNAs in a hepatoma cell line. **Science 1999**; 285(5424): 110-3

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Scientific Vita

Since 2014: Full professor (W3) "Translational Virology" at the Medical Faculty ot the University of Heidelberg

2008-2014: Professorship (apl.) at the Faculty for Biosciences at the University of Heidelberg

2001-present: Research group leader at the Department of Infectious Diseases, Molecular Virology of the University Hospital Heidelberg

2000-2001: CHS Stipendium at the ZMBH, Heidelberg University

2000: Habilitation at the faculty of Biosciences, Heidelberg University

1991-1995: PhD, Dept. of Virology (Prof. Dr. P. H. Hofschneider), Max-Planck-Institut für Biochemie, Martinsried

1991: Diploma in Biochemistry, University of Tübingen

Specific Research Interests

- Molecular mechanisms of Hepatitis B- and Hepatitis D Virus/host interactions with a focus on the early events of infection
- Identification of hepadnaviral receptors and structural analyses of virus receptor interactions
- Development of novel cell culture systems and animal models for HBV/HDV
- Clinical development of entry inhibitors (bulivertide) for HBV/HDV infection
- Development of hepatotropic drugs for the therapy of liver diseases
- Development of point of care (POC) test for HDV

Selected Publications

Wedemeyer H, Schöneweis K, et al and Urban S: A multicentre, randomised, parallel-group, open-label phase 2 clinical trial (MYR202) to assess safety and efficacy of bulevirtide in combination with tenofovir disoproxil fumarate in patients with HBV/HDV coinfection. **Lancet Infect Dis 2022**; in press

Zhang Z, Ni Y, Lempp FA, Walter L, Mutz P, Bartenschlager R and Urban S: Hepatitis D virus-induced interferon response and administered interferons control cell division-mediated virus spread. **J Hepatol 2022**; 168-8278(22)00338-5

Urban S, Neumann-Haefeliln C and Lampertico P: Hepatitis D virus in 2021: virology, immunology and new treatment approaches for a difficult-to-treat disease. **Gut 2021**; 70(9):1782-1794

Tu T, Zehnder B, Qu B and Urban S: De novo synthesis of Hepatitis B virus nucleocapsids is dispensable for the maintenance and transcriptional regulation of cccDNA. **JHEP Rep 2020**; 3(1):100195

Lempp FA, Schlund F, Rieble L, Nussbaum L, Link C, Zhang Z, Ni Y, Urban S: Recapitulation of HDV infection in a fully permissive hepatoma cell line allows efficient drug evaluation. **Nat Commun. 2019**; 10.1038/s41467-019-10211-2

Zhang Z, Filzmayer C, Ni Y, Sültmann H, Mutz P, Hiet MS, Vondran FWR, Bartenschlager R, Urban S: Hepatitis D virus replication is sensed by MDA5 and induces IFN-β/λ responses in hepatocytes. **J Hepatol 2018**; 69(1):25-35

Lempp FA, Ni Y, Urban S: Hepatitis delta virus: insights into a peculiar pathogen and novel treatment options. **Nature Reviews Gastroenterology & Hepatology 2016**; 13(10):580-9

Ni Y, Lempp FA, Mehrle S, Nkongolo S, Kaufman C, Fälth M, Stindt J, Königer C, Nassal M, Kubitz R and Urban S: Hepatitis B and D viruses exploit sodium taurocholate co-transporting polypeptide for species-specific entry into hepatocytes. **Gastroenterology 2014**; 146: 1070-1083

Urban S, Bartenschlager R, Kubitz R, Zoulim F: Strategies to inhibit entry of HBV and HDV into hepatocytes. **Gastroenterology 2014**; 7:48-64

Petersen J, Dandri M, Mier W, Lutgehetmann M, Volz T, von Weizsäcker F, Haberkorn U, Fischer L, Pollok JM, Erbes B, Seitz S and Urban S: Prevention of hepatitis B virus infection in vivo by entry inhibitors derived from the large envelope protein. **Nature Biotechnology 2008**; 26: 335-341

Gripon P, Rumin S, Urban S, Le Seyec J, Glaise D, Cannie I, Guyomard C, Lucas J, Trepo C, Guguen-Guillouzo C: Infection of a human hepatoma cell line by hepatitis B virus. **PNAS 2002**; 99(24): 15655-15660

apl. Prof. Dr. Volker Lohmann

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Web: www.molecular-virology.uni-hd.de

Scientific Vita

2020: Head of Section „Virus Host Interactions"

2012: Habilitation, Heidelberg University

2002-present: Group Leader, Heidelberg University

1998-2002: PostDoc, Institute for Virology, University of Mainz

1993-1997: PhD, University of Mainz

1987-1992: Biology School, University of Mainz

Specific Research Interests

- Replication of hepatitis C virus and hepatitis A virus
- Host cell factors of viral replication
- Lipid kinases and phosphatidylinositides
- Antiviral therapy and mode of action of inhibitors
- Role of the innate immune system in virus control
- Function of norovirus nonstructural proteins

Selected Publications

Heuss C, Rothhaar P, Burm R, Lee JY, Ralfs P, Haselmann U, Ströh LJ, Colasanti O, Tran CS, Schäfer N, Schnitzler P, Merle U, Bartenschlager R, Patel AH, Graw F, Krey T, Laketa V, Meuleman P and Lohmann V: A Hepatitis C virus genotype 1b post-transplant isolate with high replication efficiency in cell culture and its adaptation to infectious virus production in vitro and in vivo. **PLoS Pathog 2022**; 18(6):e1010472

Grünvogel O, Colasanti O, Lee JY, Klöss V, Belouzard S, Reustle A, Esser-Nobis K, Hesebeck-Brinckmann J, Mutz P, Hoffmann K, Mehrabi A, Koschny R, Vondran FWR, Gotthardt D, Schnitzler P, Neumann-Haefelin C, Thimme R, Binder M, Bartenschlager R, Dubuisson J, Dalpke AH, Lohmann V: Secretion of Hepatitis C Virus Replication Intermediates Reduces Activation of Toll-Like Receptor 3 in Hepatocytes. **Gastroenterology 2018**; 154(8):2237-2251

Schult P, Roth H, Adams RL, Mas C, Imbert L, Orlik C, Ruggieri A, Pyle AM, Lohmann V: microRNA-122 amplifies hepatitis C virus translation by shaping the structure of the internal ribosomal entry site. **Nat Commun 2018**; 4; 9(1):2613

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Lohmann V., Körner F, Koch JO, Herian U, Theilmann L and Bartenschlager R.: Replication of subgenomic hepatitis C virus RNAs in a hepatoma cell line. **Science 1999**; 285: 110-113

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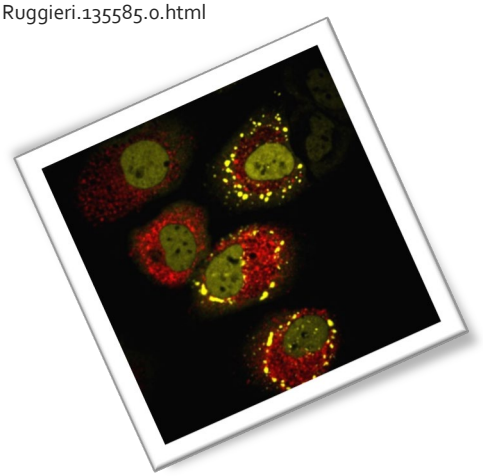

Scientific Vita

2014-present: Independent group leader at the Department of Infectious Diseases, Heidelberg University

2008–2013: PostDoc at the Department of Infectious Diseases, Heidelberg University

2004–2008: PostDoc at the Institute of Human Genetics, University of Saarland

1999–2003: PhD in Virology, École Normale Supérieure de Lyon, France

1998–1999: Diploma thesis, University of Lyon, France

1995–1998: Studies in Cellular and Molecular Biology Metz and Lyon, France

Specific Research Interests

- Dynamics of the host stress response to RNA virus infection
- Crosstalk between host stress and innate immune responses
- Interplay of Flaviviruses with the host cell translation machinery
- Unconventional translation initiation of dengue virus genome
- Flavivirus epitranscriptomics: role of RNA modifications in the flavivrus life cycle

Selected Publications

Klein P*, Kallenberger SM*, Roth H, Roth K, Ly-Hartig TBN, Magg V, Aleš J, Talemi SR , Qiang Y, Wolf S, Oleksiuk O, Kurilov R, Di Ventura B, Bartenschlager R, Eils R, Rohr K, Hamprecht FA, Höfer T, Fackler OT, Stoecklin G, Ruggieri A: Temporal control of the integrated stress response by a stochastic molecular switch. **Science Advances 2022**; 8(12):eabk2022

Ruggieri A, Helm M, Chatel-Chaix L: An epigenetic "extreme makeover": the methylation of flaviviral RNA (and beyond). **RNA Biology 2021**; 18:1-13

Eiermann N, Haneke K, Sun Z, Stoecklin G, Ruggieri A: Dance with the devil: Stress granules and signaling in antiviral responses. **Viruses 2020**; 12(9), 984

Haneke K, Schott J, Lindner D, Hollensen AK, Damgaard CK, Mongis C, Knop M, Palm W, Ruggieri A, Stoecklin G: CDK1 couples proliferation with protein synthesis. **J Cell Biol. 2020**; 219(3): e201906147

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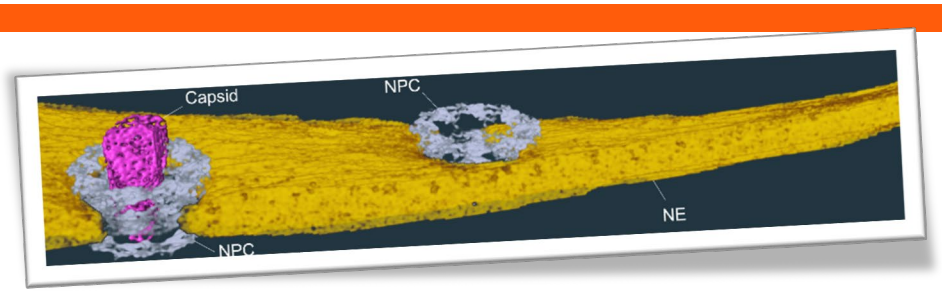
Roth H, Magg V, Uch F, Mutz P, Klein P, Haneke K, Lohmann V, Bartenschlager R, Fackler OT, Locker N, Stoecklin G, Ruggieri A: Flavivirus infection uncouples translation suppression from cellular stress responses. **mBio 2017**; 8(1):e02150-16

Brocard M, Ruggieri A, Locker N: m6A RNA methylation, a new hallmark in virus-host interactions. **J Gen Virol. 2017**; 98(9):2207-2214

Ruggieri A, Dazert E, Metz P, Hofmann S, Bergeest JP, Mazur J, Bankhead P, Hiet MS, Kallis S, Alvisi G, Samuel CE, Lohmann V, Kaderali L, Rohr K, Frese M, Stoecklin G, Bartenschlager R: Dynamic oscillation of translation and stress granule formation mark the cellular response to virus infection. **Cell Host Microbe 2012**; 12(1): 71-85.

Virology



Fields of Interest

Groups in Virology are interested in the molecular mechanisms leading to viral infection. The broad expertise of the various groups within the department allows us to dissect various steps in the viral life cycle, ranging from receptor binding to assembly and release, and to investigate pathogen-host interactions for a number of medically relevant viruses.

A major focus of our research is human immunodeficiency virus (HIV), the causative agent of AIDS (Kräusslich, Müller). In spite of several decades of intense research, many questions concerning the biology of the virus remain unanswered; among these are surprisingly basic questions as 'Where does the virus enter the host cell?' or 'When and how is virus maturation initiated?' Our projects address the molecular and structural biology of the virus and its interaction with the host cell, including the evaluation of novel targets for antiviral therapy. We mainly focus on detailed analyses of virus morphogenesis and structure, as well as on the cell biology and dynamics of HIV entry, assembly and release and the induction of the innate immune response. To address these topics, we combine traditional biochemical and virological approaches with advanced imaging techniques (live-cell imaging, novel fluorescent labeling strategies, various super-resolution fluorescence microscopy, (cryo)electron microscopy and -tomography, correlative microscopy, click chemistry) that we employ alone or together with strong collaborators. By this we aim at a quantitative and time resolved description of HIV-1 entry and morphogenesis, delineating the mechanistic role of viral and cellular factors (proteins and lipids) in these processes.

Other viral systems studied include parvoviruses, the enteropathogens norovirus and reovirus, bunyaviruses, influenza virus and hepatitis E virus. We develop and use vectors based on adeno-associated virus for basic research and gene therapy approaches (Grimm) and exploit the CRISPR/Cas system for gene therapeutic and antiviral strategies (Grimm, Kräusslich). The Hansman group investigates the structural biology of the interaction of noroviruses, a major cause of infectious diarrhea, with cellular binding molecules. A further focus of interest is virus entry: the Lozach group is interested in entry pathways of bunyaviruses in the mammalian host and arthropod vector cells, whereas the Boulant group addresses the induction of innate immune response upon reovirus entry in human polarized intestinal epithelial cells and organoid systems, and the group of Dao Thi studies interactions between Hepatitis E virus and host cells in stem-cell derived culture systems. Finally, we are interested in influenza virus structure, particle formation and entry, and in the role of host proteins and lipids in these processes (Kräusslich, Chlanda). Combination of conventional virological approaches with a wide variety of specialized techniques (e.g. cryo-electron tomography, high throughput approaches, advanced fluorescence microscopy techniques, x-ray crystallography and more) is employed to address our virological questions.

The following teams belong to the Virology:

-Prof. Dr. Hans-Georg Kräusslich (Head of the Virology)

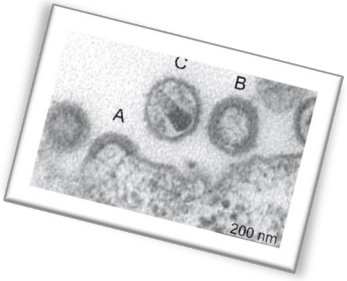
-Prof. Dr. Dirk Grimm

-apl. Prof. Dr. Barbara Müller

-Dr. Frauke Mücksch

-Dr. Petr Chlanda

-Dr. Viet Loan Dao Thi



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Scientific Vita

2019–present: Dean of the Medical Faculty, Heidelberg University

2019–2021: coordinator, German Center of Infectious Disease Research

2014–2019: Vice-dean for research Medical Faculty, Heidelberg University

2004–present: Director Department of Infectious Diseases, Heidelberg University

2000–present: Full professor and head of virology, Heidelberg University

1996–1999: Director, Leibniz Institute of Virology, Hamburg

1993–1995: Head of junior department, German Cancer Research Centre, Heidelberg

1990: Habilitation, University of Heidelberg

1989–1993: Group leader, German Cancer Research Centre, Heidelberg

1986–1989: PostDoc, Dept. of Mol. Biology, State Univ. New York at Stony Brook

1985: MD in experimental virology (LMU Munich)

1977–1984: Medical School (LMU Munich)

Specific Research Interests

- Cell biology of virus infection
- Virus-host interactions in the early post-entry phase of viral replication
- Nuclear import of HIV-1
- Structural and functional analyses of HIV-1 and influenza virus assembly and release
- HIV Protease and antiviral resistance

Selected Publications

Müller TG, Zila V, Müller B, Kräusslich HG: Nuclear Capsid Uncoating and Reverse Transcription of HIV-1. **Annual review of virology 2022**

Qu K, Ke Z, Zila V, Anders-Össwein M., Glass B, Mücksch F, Müller R, Schultz C, Müller B, Kräusslich HG, Briggs JAG: Maturation of the matrix and viral membrane of HIV-1. **Science 2021**; 373, 700-704

Zila, V., Margiotta, E., Turonova, B., Müller, T.G., Zimmerli, C.E., Mattei, S., Allegretti, M., Borner, K., Rada, J., Müller, B., et al.: Cone-shaped HIV-1 capsids are transported through intact nuclear pores. **Cell 2021**; 184, 1032-1046 e1018

Müller TG, Zila, V., Peters K, Schifferdecker S, Stanic M, Lucic B, Laketa V, Lusic M, Müller B, Kräusslich HG: HIV-1 uncoating by release of viral cDNA from capsid-like structures in the nucleus of infected cells. **eLife 2021**; doi: 10.7554/eLife.64776

Bejarano DA, Peng K, Laketa V, Börner K, Jost KL, Lucic B, Glass B, Lusic M, Müller B, Kräusslich HG: HIV-1 nuclear import in macrophages is regulated by CPSF6-capsid interactions at the nuclear pore complex**. Elife 2019**; 8:e41800

Mücksch F, Laketa V, Müller B, Schultz C, Kräusslich HG: Synchronized HIV assembly by tunable PIP2 changes reveals PIP2 requirement for stable Gag anchoring. **Elife 2017**; pii: e25287. doi: 10.7554/eLife.25287

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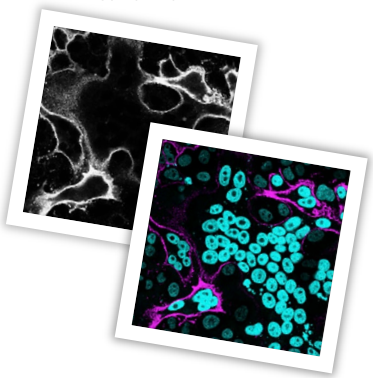
Chojnacki J, Staudt T, Glass B, Bingen P, Engelhardt J, Anders M, Schneider J, Müller B, Hell SW, Kräusslich HG: Maturation Dependent HIV-1 Surface Protein Redistribution Revealed by Fluorescence Nanoscopy. **Science 2012**; 338:524-528



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Scientific Vita

2000-present: Group leader, Department of Infectious Diseases, Heidelberg

2004: Habilitation (Experimental Virology, Heidelberg University)

1995-2000: Postdoctoral fellow/research associate, Leibniz Institute of Virology, Hamburg

1995: Postdoctoral fellow, German Cancer Research Center Heidelberg

1992-1995: Postdoctoral fellow, Fox Chase Cancer Center, Philadelphia, USA

1991-1992: Postdoctoral associate, MPI for Medical Research, Heidelberg

1991: Dr. rer. nat., Heidelberg University

1987: Diploma (Heidelberg University)

1981-1986: Study of Biology (Technical University Darmstadt, Heidelberg University)

Specific Research Interests

- Biology of human immunodeficiency virus
- Fluorescently labeled HIV-1 derivatives
- Dynamics of HIV cell entry and HIV particle formation
- HIV assembly and maturation
- Quantitative analysis of HIV replication steps

Selected Publications

Movie:
http://www.spektrum.de/video/partner/cellnetworks/virus-cell-interactions-brought-to-light/1471891

Schifferdecker S, Zila V, Müller TG, Sakin V, Anders-Össwein M, Laketa V, Kräusslich HG, Müller B: Direct Capsid Labeling of Infectious HIV-1 by Genetic Code Expansion Allows Detection of Largely Complete Nuclear Capsids and Suggests Nuclear Entry of HIV-1 Complexes via Common Routes. **MBio 2022**; doi: 10.1128/mbio.01959-22

Müller TG, Zila V, Müller B, Kräusslich HG: Nuclear Capsid Uncoating and Reverse Transcription of HIV-1. **Annual review of virology 2022**

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Pape C, Remme R, Wolny A, Olberg S, Wolf S, Cerrone L, Cortese M, Klaus S, Lucic M, Ullrich S, Wolf S, Cerikan B, Neufeldt CJ, Ganter M, Schnitzler P, Merle U, Lusic M, Boulant S, Stanifer M, Bartenschlager R, Hamprecht FA, Kreshuk A, Tischer C, Kräusslich HG, Müller B, Laketa V: Microscopy-based assay for semi-quantitative detection of SARS-CoV-2 specific antibodies in human sera: A semi-quantitative, high throughput, microscopy-based assay expands existing approaches to measure SARS-CoV-2 specific antibody levels in human sera. **BioEssays 2021**; 43, e2000257

Müller TG, Sakin V, Müller B: A Spotlight on Viruses-Application of Click Chemistry to Visualize Virus-Cell Interactions. **Molecules 2019**; doi: 10.3390/molecules240304 81

Sakin V, Hanne J, Dunder J, Anders-Össwein M, Laketa V, Nikić I, Kräusslich HG, Lemke EA, Müller B: A Versatile Tool for Live-Cell Imaging and Super-Resolution Nanoscopy Studies of HIV-1 Env Distribution and Mobility. **Cell Chem Biol 2017**; 24: 635-645.e5

Schimer J, Pavova M, Anders M, Pachl P, Sacha P, Cigler P, Weber J, Majer P, Rezacova P, Kräusslich HG, Müller B***, Konvlinka J***: Triggering HIV polyprotein processing inside virions by rapid photodegradation of a tight-binding photodestructable protease inhibitor. **Nature Communications 2015**; 6:6461

Baumgärtel V, Ivanchenko S, Dupont A, Sergeev M, Wiseman PW, Kräusslich HG, Bräuchle C, Müller B***, Lamb DC***: Dynamics of HIV budding site interactions with an ESCRT component visualized in live cells. **Nat Cell Biol 2011**; 13: 469-474

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Scientific Vita

2022-present: Full professor (W3) "Virale Vektortechnologie" at the Medical Faculty of the Heidelberg University Hospital

2017-2022: Professor (W2) "Virale Vektortechnologie", at the Medical Faculty of the Heidelberg University Hospital

2007-present: Group leader "Virus-Host Interactions", Heidelberg University Hospital

2006-2007: Research Associate, Stanford University, School of Medicine, CA, USA

2001-2006: PostDoc, Stanford University, School of Medicine, CA, USA

1999-2001: PostDoc, German Cancer Research Center, Heidelberg

1998: PhD (Biology) with Summa cum laude, University of Heidelberg

1988-1994: Study of Biology (Universities of Kaiserslautern and Heidelberg)

Specific Research Interests

- Human gene therapy
- Viral and parasital infections (HIV, hepatitis viruses, Plasmodium)
- Adeno-associated viral (AAV) and bocaviral (BoV) vectors
- Gene/genome engineering (CRISPR, TALENs)
- RNA interference (RNAi)
- Induced pluripotent stem cells (iPSC)
- Synthetic biology

Selected Publications

Andari JE, Renaud-Gabardos E, Tulalamba W, Weinmann J, Mangin L, Pham QH, Hille S, Bennett A, Attebi E, Bourges E, Leborgne C, Guerchet N, Fakhiri J, Krämer C, Wiedtke E, McKenna R, Guianvarc'h L, Toueille M, Ronzitti G, Hebben M, Mingozzi F, VandenDriessche T, Agbandje-McKenna M, Müller OJ, Chuah MK, Buj-Bello A, Grimm D: Semi-rational bioengineering of AAV vectors with increased potency and specificity for systemic gene therapy of muscle disorders. **Sci Adv 2022**; in press.

Weinmann J, Weis S, Sippel J, Tulalamba JW, Remes A, El Andari J, Herrmann AK, Pham QH, Borowski C, Hille S, Schöneberger T, Frey N, Lenter M, VandenDriessche T, Müller OJ, Chuah MK, Lamla T, Grimm D: Identification of a myotropic AAV by massively parallel in vivo evaluation of barcoded capsid variants. **Nat Commun 2020**; 28: 5432

Börner K, Kienle E, Huang LY, Weinmann J, Sacher A, Bayer P, Stüllein C, Fakhiri J, Zim-mermann L, Westhaus A, Beneke J, Beil N, Wiedtke E, Schmelas C, Miltner D, Rau A, Erfle H, Kräusslich HG, Müller M, Agbandje-McKenna M, Grimm D: Pre-arrayed pan-AAV peptide display libraries for rapid single-round screening. **Mol Ther 2020**; 28:1016-1032

Senís E, Mosteiro L, Wilkening S, Wiedtke E, Nowrouzi A, Afzal S, Fronza R, Landerer H, Abad M, Niopek D, Schmidt M, Serrano M, Grimm D: AAV vector-mediated in vivo reprogramming into pluripotency. **Nat Commun 2018**; 9:2651

Michler T, Grosse S, Mockenhaupt S, Röder N, Stückler F, Knapp B, Ko C, Heikenwälder M, Protzer U, Grimm D: Blocking sense strand activity improves potency, safety and specificity of anti-hepatitis B virus short hairpin RNA. **EMBO Mol Med 2016**; 8:1082-98

Rezvani M, Espanol-Suner R, Malato Y, Dumont L, Grimm AA, Kienle E, Bindman J, Wiedtke E, Hsu BY, Naqvi SJ, Schwabe RF, Covera CU, Grimm D, Willenbring H: In vivo reprogramming of myofibroblasts into hepatocytes as a therapeutic strategy for liver fibrosis. **Cell Stem Cell 2016**; 18:809-816

Mockenhaupt S, Grosse S, Rupp D, Bartenschlager R and Grimm D: Alleviation of off-target effects from vector-encoded shRNA via co-delivered RNA decoys. **PNAS 2015**; 112:E4007-16

Grimm D, Wang L, Lee JS, Schürmann N, Gu S, Börner K, Storm TA and Kay MA: Argonaute proteins are key determinants of RNAi efficacy, toxicity, and persistence in the adult mouse liver. **J Clin Invest 2010**; 120:3106-19

Grimm D, Lee JS, Wang L, Desai T, Akache B, Storm TA and Kay MA. In vitro and in vivo gene therapy vector evolution via multispecies interbreeding and re-targeting of adeno-associated viruses. **J Virol 2008**; 82:5887-911

Grimm D, Streetz KS, Jopling CL, Storm TA, Pandey K, Davis CR, Marion P, Salazar F and Kay MA: Fatality in mice due to oversaturation of cellular microRNA/short hairpin RNA pathways. **Nature 2006**; 441:537-41

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Scientific Vita

2018-present: Chica and Heinz Schaller Junior Group Leader, University Hospital Heidelberg

2015-2017: Postdoctoral fellow, The Rockefeller University, USA

2012-2014: Postdoctoral associate, Institute of Microbiology of the University Hospital Centre Vaudois and of the University of Lausanne, Switzerland

2007-2011: PhD, Ecole Normale Superieur de Lyon, France

2003-2004: MSc, Dongseo University, South Korea

2000-2006: Dipl.-Ing, Berlin Institute of Technology, Germany

Specific Research Interests

- Hepatotropic viruses with a special focus on hepatitis E virus (HEV)
- Stem cell technology for improved cell culture models
- Personalized models of virus infection, precision medicine
- Antiviral therapy and therapy resistance

Selected Publications

Maurer L, El Andari J, Rapti K, Spreyer L, Steinmann E, Grimm D, Dao Thi VL: Induction of Hepatitis E virus anti-ORF3 antibodies from systemic administration of a muscle-specific adeno-associated virus (AAV) vector. **Viruses 2022**; 14(2): 266

Zhang C, Freistaedter A, Schmelas C, Gunkel M, Dao Thi VL, Grimm D: An RNA interference/adeno-associated virus vector-based combinatorial gene

therapy approach against Hepatitis E virus. **Hepatol Commun. 2021**; 6(4):878-888

Bove G, Mehnert A-K, Dao Thi VL: Chapter 7, iPSCs for modeling hepatotropic pathogen infections, Editor: Alexander Birbrair, In Advances in Stem Cell Biology, iPSCs for Studying Infectious Diseases, **Academic Press 2021**; Volume 8, p. 149-213

Dao Thi VL, Wu X, Belote RL, Andreo U, Takacs CN, Fernandez JP, Vale-Silva LA, Decker CC, Fu RM, Qu B, Uryu K, Molina H, Saeed M, Steinmann E, Urban S, Singarja RR, Schneider WM, Simon SM, Rice CM: Stem cell-derived polarized hepatocytes. **Nature Commun. 2020**; 11(1):1677

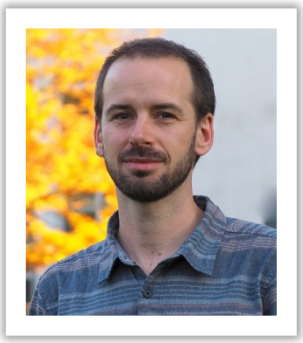
Fu RM, Decker CC, Dao Thi VL: Cell Culture Models for Hepatitis E Virus. **Viruses 2019**; 11(7):608

Wu X, Dao Thi VL, Liu P, Takacs CN, Xiang K, Andrus L, Gouttenoire J, Moradpour D, Rice CM: Pan-Genotype Hepatitis E Virus Replication in Stem Cell-Derived Hepatocellular Systems. **Gastroenterology 2018**; 154(3):663-674

Wu X, Dao Thi VL, Huang Y, Billerbeck E, Saha D, Hoffmann HH, Wang Y, Vale Silva LA, Sarbanes S, Sun T, Andrus L, Quirk C, MacDonald MR, Schneider WM, An X, Rosenberg BR, Rice CM: Intrinsic Immunity Shapes Viral Resistance of Stem Cells. **Cell 2018**; 172(3):423-438

Dao Thi VL, Debing Y, Wu X, Rice CM, Neyts J, Moradpour D, Gouttenoire J: Sofosbuvir inhibits Hepatitis E virus replication in vitro and results in an additive effect when combined with ribavirin. **Gastroenterology 2016**; 150:82-85

Dr. Petr Chlanda



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Scientific Vita

2017-present: Schaller research group leader at the Department for Infectious Diseases-Virology, University of Heidelberg Medical School

2011-2017: Postdoc at the National Institutes of Health, Bethesda, USA

2010-2011: Postdoc at the European Molecular Biology Laboratory, Heidelberg, Germany

2006-2010: Ph.D. at Heidelberg University, Heidelberg, Germany

Specific Research Interests

- virology
- cryo-electron microscopy
- membranes and lipids
- cell biology
- membrane fusion

Selected Publications

Chlanda P, Mekhedov E, Waters H, Sodt A, Schwartz C, Nair V, Blank PS, Zimmerberg J: Palmitoylation contributes to membrane curvature in Influenza A virus assembly and hemagglutinin-mediated membrane fusion. **J Virol 2017**; 91(21)

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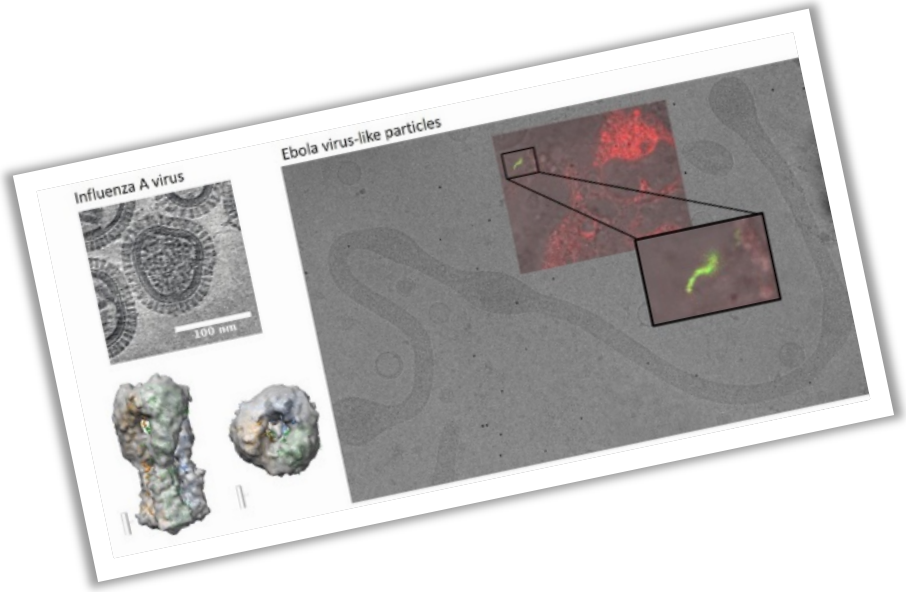
Chlanda P, Carbajal MA, Cyrklaff M, Griffiths G, Krijnse-Locker J: Membrane rupture generates single open membrane sheets during vaccinia virus assembly. **Cell Host Microbe 2009**; 6(1):81-90



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Scientific Vita

2022-present: Chica and Heinz Schaller Junior Group Leader, Department of Infectious Diseases, Virology, Heidelberg University

2019-2022: PostDoc, The Rockefeller University, New York, USA

2018-2019: PostDoc, Department of Infectious Diseases, Heidelberg University

2013-2017: PhD in virology with Summa cum laude, Heidelberg University

2011-2013: MSc (Biomedical Science), University of Marburg

Specific Research Interests

- Molecular virology, virus-host interaction
- Immuno- and cell biology of HIV-1 infection
- Regulation of HIV-1 transcription
- Establishment and reversal of HIV-1 latency

Selected Publications

Muecksch F*, Wise H*, Templeton K, Batchelor B, Squires M, McCance K, Jarvis L, Malloy K, Furrie E, Richardson C, MacGuire J, Goldber I, Burns A, Mavin A, Zhang F, Schmidt F, Bieniasz PD, Jenks S, Hatziioannou T: Longitudinal variation in SARS-CoV-2 antibody levels and emergence of SARS-CoV-2 variants: a serological analysis. **Lancet Microbe 2022**; 3(7):e493-502

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Bou-Nader C*, Muecksch F*, Brown J, Gordon JM, York A, Peng C, Ghirlando R, Summers MF, Bieniasz PD, Zhang J: Structural basis for host tRNA control of HIV-1 Gag localization. Cell Host Microbe 2021; 29(9):1421-1436 *co-first author

Wang Z*, Schmidt F*, Weisblum Y*, Muecksch F*, Barnes CO*, Finkin S*, Schaefer-Babajew D*, Cipolla M*, Gaebler C*, Lieberman JA*, Oliveira TY, Yang Z, Abernathy ME, Huey-Tubman KE, Hurley A, Turroja M, West KA, Gordon K, Millard KG, Ramos V, Da Silva J, Xu J, Colbert RA, Patel R, Dizon J, Unson-O'Brien C, Shimeliovich I, Gazumyan A, Caskey M, Bjorkman PJ, Casellas R, Hatziioannou T, Bieniasz PD, Nussenzweig MC: mRNA vaccine-elicited antibodies to SARS-CoV-2 and circulating variants. **Nature 2021**; 592, 616-622 *co-first author

Robbiani DF*, Gaebler C*, Muecksch F*, C Lorenzi JC*, Wang Z*, Cho A*, Agudelo M*, Barnes CO*, Gazumyan A*, Finkin S*, Hägglöf S, Oliveira TY, Viant C, Hurley A, Hoffmann H-H, Millard KG, Kost RG, Cipolla M, Gordon K, Bianchini F, Chen ST, Ramos V, Patel R, Dizon J, Shimeliovich I, Mendoza P, Hartweger H, Nogueira L, Pack M, Horowitz J, Schmidt F, Weisblum Y, Michailidis E, Ashbrook AW, Waltari E, Pak JE, Huey-Tubman KE, Koranda N, Hoffman PR, West Jr AP, Rice CM, Hatziioannou T, Bjorkman PJ, Bieniasz PD, Caskey M, Nussenzweig MC: Convergent antibody responses to SARS-CoV-2 in convalescent individuals. **Nature 2020**; 584, 437-422 *co-first author

Mücksch F*, Citir M*, Lüchtenborg C, Glass B, Traynor-Kaplan A, Schultz C, Brügger B, Kräusslich HG. Quantification of phosphoinositides reveals strong enrichment of PIP2 in HIV-1 compared to producer cell membranes. **Sci Rep 2019**; 9, 17661

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Integrative Virology

Fields of Interest

Our work aims at dissecting general principles of host cell biology and immunology that are exploited and hijacked by HIV-1 to cause disease. To this end we apply advanced virology, cell biology and molecular biology techniques to cell systems with physiological relevance ranging from individual primary cell types to organoid and organotypic cell cultures to in vivo models.

Part Fackler laboratory:

Our research addresses the cell biology, immunology and pathogenesis of HIV 1 infection with an emphasis on CD4+ T lymphocytes. One focus of our studies is on the molecular mechanisms of action by which the HIV 1 pathogenicity factor Nef reprograms host cell vesicular transport, signal transduction and motility to optimize HIV 1 spread in the host and to accelerate disease progression. Another important aspect of our work is on the host innate immune system in HIV infection and on viral evasion mechanisms. This includes dissecting how the intrinsic immunity factor SERINC5 impairs HIV 1 particle infectivity and how this activity is antagonized by the viral protein Nef, but also studies to elucidate which barriers prevent productive HIV 1 infection of resting CD4+ T lymphocytes. These HIV-related studies involve the development of complex 3D culture systems for studying the relationship between host cell motility and HIV 1 spread in tissue. Finally, we are also interested in the cell biology of CD4 T cell activation and differentiation. In this context, we particularly focus on the newly identified role of nuclear actin filament formation for CD4 T cell help.

Part Lusic laboratory:

The studies of the Lusic laboratory focus on deciphering the cellular mechanisms used by the virus to either promote or repress viral gene expression. We investigate which parameters control integration of the viral genome and subsequent gene expression, with a strong focus on reactivation of viral gene expression after a silent phase of latency.

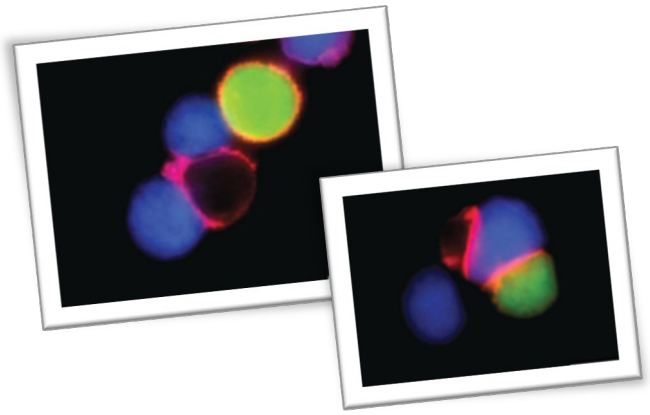
While an overall goal of our laboratory is to explore the specific contributions of nuclear topology and chromatin factors to HIV integration site selection and establishment of latency, we are specifically interested in determining the role of nuclear pore complex proteins in integration site selection. Moreover, we would like to focus on the interactions between nucleoporins with proteins that we previously found to contribute to proviral latency such as TRIM proteins.

Our methodology comprises the visualization of integrated HIV DNA in host cells by using a combination of 3D Immuno DNA FISH and Chromatin Immunoprecipitation technology.

The following teams belong to the Integrative Virology:

-Prof. Dr. Oliver T. Fackler (Head of the Integrative Virology)

-Dr. Marina Lusic



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Scientific Vita

2013-present: Head of section Integrative Virology, Department of Infectious Diseases, Virology, Heidelberg University

2007-present: W3 professor at the Department of Infectious Diseases, Virology, Heidelberg University

2003: Habilitation in experimental virology, Heidelberg University

2000-2007: Group leader, Department of Virology, Heidelberg University

1994-1997: PhD in molecular virology (Homburg/Saar)

1993-1994: Diploma thesis in molecular virology (Homburg/Saar)

1989-1993: Studies in biology (Saarbrücken)

Specific Research Interests

- Immuno- and cell biology of HIV infection
- Adaptive and Innate immunity against HIV-1 and viral evasion thereof
- Synthetic and organotypic 3D models of HIV pathogenesis
- CD4 T cell biology

Selected Publications

Imle A, Kumberger P, Schnellbächer ND, Fehr J, Carrillo-Bustamante P, Ales J, Schmidt P, Ritter C, Godinez WJ, Müller B, Rohr K, Hamprecht FA, Schwarz US, Graw F, Fackler OT: Experimental and computational analyses reveal that environmental restrictions shape HIV-1 spread in 3D cultures. **Nat Commun.** 2019; 10:2144

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Imle A, Abraham L, Tsopoulidis N, Hoflack B, Saksela K and Fackler OT: Association with PAK2 Enables Functional Interactions of Lentiviral Nef Proteins with Exocyst**. mBio 2015**; 6: e01309-15

Fackler OT, Murooka TT, Imle A, Mempel TR: Adding new dimensions: Towards an integrative understanding of HIV-1 spread. **Nat Rev Microbiol 2014**; 12:563-574

Kutscheidt S, Zhu R, Antoku S, Luxton GGW, Stagljar I, Fackler OT, Gundersen G: FHOD1 interaction with nesprin-2G mediates TAN line formation and nuclear movement. **Nat Cell Biol 2014**; 16: 708-715

Baldauf HM, Pan X, Erikson E, Schmidt S, Daddacha W, Burggraf M, Schenkova K, Ambiel I, Wabnitz G, Gramberg T, Panitz S, Flory E, Landau NR, Sertel S, Rutsch F, Lasitschka F, Kim B, König R, Fackler OT*, Keppler OT*: The deoxynucleoside triphosphate triphosphohydrolase SAMHD1 restricts HIV-1 infection in resting CD4+ T cells. **Nat Med 2012**; 18: 1682-1687, (* corresponding authors)

Stolp B, Imle A, Coelho FM, Hons M, Mendiz RG, Lyck R, Stein JV and Fackler OT: HIV-1 Nef Interferes With T Lymphocyte Circulation Through Confined Environments in vivo. **PNAS 2012**; 109: 18541–18546

Pan X, Rudolph JM, Abraham L, Habermann A, Haller C, Krijnse-Locker J and Fackler OT: HIV-1 Nef Compensates Disorganization of the Immunological Synapse by Assembly of an Intracellular Lck Signalosome. **Blood 2012**; 119: 786-797

Stolp B, Raichman-Fried M, Abraham L, Pan X, Giese SI, Hannemann S, Goulimari P, Raz E, Grosse R and Fackler OT: HIV-1 Nef interferes with host cell motility by deregulation of cofilin. **Cell Host Microbe 2009**; 6:174-186

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Scientific Vita

2014-present: Group leader, Department of Infectious Diseases, Heidelberg

2009-2014: Extended faculty member/project leader at San Raffaele Scientific Institute, Milan and ICGEB, Trieste, Italy

2004-2009: PostDoc, ICGEB, Trieste, Italy

2003: PhD degree in Molecular Biology and Biochemistry, Faculty of Biological Sciences, University of Belgrade

1999-2004: Long term ICGEB Fellowship, Molecular Medicine Laboratory, International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy

1998: Magister of Science, Biochemistry and Molecular Biology, University of Belgrade

- Nuclear organization and chromatin changes upon viral infection
- Control of HIV-1 integration and cellular fate
- HIV-1 transcription and latency; role of oxidative stress

Selected Publications

Lusic M and Robert F. Siliciano: Nuclear landscape of HIV-1 infection and integration. **Nat Rev Microb 2016**; (in press)

Lucic B and Lusic M: Connecting HIV-1 integration and transcription: a step toward new treatments. **FEBS Letters 2016**; 590 (13):1927

Marini B, Kertesz-Farkas A, Lucic B, Hashim A, Lisek K, Manganaro L, Pongor S, Luzzati R, Mavilio F, Giacca M and Lusic M: Nuclear architecture dictates HIV-1 integration site selection. **Nature 2015**; 14;521(7551):227-31

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Lusic M and Giacca M: Regulation of HIV-1 latency by chromatin structure and nuclear architecture. **J Mol Biol 2014**; 427(3):688-94 Review

Lusic M, Marini B, Ali H, Lucic B, Luzzati R and Giacca M: Proximity to PML Nuclear Bodies negatively regulates HIV-1 gene expression in CD4+ T cells. **Cell Host Microbe 2013**; 13: 665-677. Research highlight in Science Vol 341 (2013) p:11 and in Cell Host Microbe Vol 13:625-626

Della Chiara G, Crotti A, Liboi E, Giacca M, Poli G and Lusic M: Negative Regulation of HIV-1 Transcription by a Heterodimeric NF-κB1/p50 and C-Terminally Truncated STAT5 Complex. **J Mol Biol 2011**; 410 (5): 933-943

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Dieudonné M, Maiuri P, Biancotto C, Knezevich A, Kula A, Lusic M, and Marcello A: Transcriptional competence of the integrated HIV-1 provirus at the nuclear periphery. **EMBO J 2009**; 28 (15):2231-2243

Perkins KJ, Lusic M, Mitar I, Giacca M and Proudfoot NJ: Transcription dependent gene looping of the HIV-1 provirus is dictated by recognition of pre-mRNA processing signals. **Molecular Cell 2008**; 29 (1) 56-68

Parasitology

Fields of Interest

Malaria has remained one of the most important infectious diseases worldwide, causing an estimated 214 million clinical cases and killing approximately 438,000 people every year (WHO, 2015). Hopes of malaria control have been thwarted by widespread drug resistances. Malaria is caused by protozoan parasites of the genus Plasmodium, of which Plasmodium falciparum is the most virulent form. Infection starts with the bite of an infected Anopheles mosquito that transmits infective stages termed sporozoites into the human body. Sporozoites are carried with the blood flow to the liver where they invade hepatocytes. After completing their development within the liver, the parasite is released and now invades erythrocytes. Intra-erythrocytic development of the parasite is responsible for the clinical manifestation of the disease, including intermittent fever, shaking chills, organ dysfunction and the syndromes associated with cerebral and maternal malaria. Severe complications result from the ability of infected erythrocytes to adhere to the endothelial lining of venular capillaries and to sequester in the deep vascular bed.

Malaria research conducted by the Parasitology Unit includes the following aspects:

The Lanzer lab addresses key questions related to the molecular and biophysical mechanisms underpinning cytoadhesion of Plasmodium falciparum-infected erythrocytes. P. falciparum is the most virulent of the 5 Plasmodium species that can cause malaria in humans. The group is further interested in understanding how genetic polymorphisms in the human genome, such as those leading to sickle cell haemoglobin or haemoglobin C protect carriers from severe malaria-related disease and death. Another research focus concerns mechanisms of drug resistance and strategies to overcome established resistance mechanisms, including the development of novel antimalarial drugs.

The Frischknecht lab studies the formation and motility of the sporozoite and the intracellular development within the liver using a mix of reverse genetics, imaging and biophysical approaches. Studies are mainly performed using rodent malaria parasites, which can be easier manipulated than the human parasites. The group has many collaboration partners on the Heidelberg campus and around the world.

The Ganter lab investigates the unusual way in which the malaria-causing parasite *Plasmodium falciparum* proliferates. During this process, *P. falciparum* develops cells that contain multiple nuclei. Typically, when two or more nuclei share the same cytoplasm, they progress synchronously through the cell cycle. However, *P. falciparum* nuclei divide asynchronously despite residing in the same cytoplasm. Using various approaches, including reverse genetics, imaging, and proteomics, the group investigates the molecular mechanisms that drive this non-canonical cell cycle.

The Guizetti lab studies the unusual cell division mechanisms of the malaria parasite Plasmodium falciparum. Rapid mitotic divisions enable proliferation of the parasite in the human blood cells and contribute to disease severity. Even though mitosis in this parasite shows significant differences to what has been described in classical model organisms, it is poorly studied so far. We use super-resolution, electron, and live cell microscopy technologies combined with CRISPR/Cas9 genome editing to describe the dynamics and regulation of chromosomes, centromeres, and the nuclear envelope during division. Thereby we hope to uncover new targets within this essential pathway and contribute to the fight against malaria.

The Thomson-Luque lab (MCTU) focuses on the development of novel anti-malaria vaccines and therapies. We are funded by Sumaya-Biotech, and are currently testing a malaria vaccine based on the fIMSP-1 protein which targets both liver and blood stages of the malaria parasite *Plasmodium falciparum*. After a phase Ia carried out in Heidelberg in 2018, we plan to start a phase Ib trial in semi-naïve individuals in Africa together with the SwisTPH and the Ifakara Institute of Health in Tanzania. We are further working on different approaches such as an Adeno6-MSP1 as well as an fIMSP1 mRNA vaccine.

The Ingham lab aims to explore the interaction between parasite development and insecticide resistance in the major malaria vector Anopheles coluzzii. The group will specifically concentrate on the impacts of insecticide exposure and the associated changes in oxidative stress levels on the mosquito and how perturbation of this pathway can potentially be exploited for vector control. To achieve these aims, the group will use a variety of techniques including mosquito/parasite phenotyping, RNAseq, RNAi, molecular biology methods and advanced imaging.

The following teams belong to the Parasitology Unit:

-Prof. Dr. Michael Lanzer (Head of the Parasitology Unit)

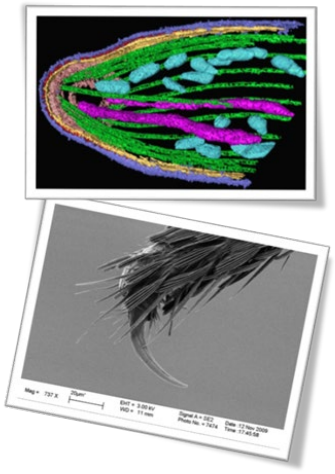
-Prof. Dr. Friedrich Frischknecht

-Dr. Markus Ganter

-Dr. Julien Guizetti

-Dr. Richard Thomson Luque

-Dr. Victoria Ingham



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Scientific Vita

2000: Chair of Parasitology offered by the Seattle Biomedical Institute, USA *(*declined)

1999: Full Professor & Department Chair of Parasitology, Heidelberg University

1996: Habilitation in Microbiology, University of Würzburg

1994-1998: Junior Group Leader, Research Center for Infectious Diseases, University of Würzburg

1988-1993: PostDoc, Sloan-Kettering Inst., New York

1985-1988: Graduate Student, Center for Molecular Biology, Heidelberg University

1984-1985: Undergraduate Student, Hoffman LaRoche AG, Basel

Specific Research Interests

- Molecular Parasitology

- Antigenic variation, cytoadherence, protein trafficking in *P. falciparum*
- Membrane transport processes

Selected Publications

Pegoraro S, Duffey M, Otto TD, Wang Y, Rosemann R, Baumgartner R, Fehler SK, Lucantoni L, Avery VM, Moreno-Sabater A, Mazier D, Vial HJ, Strobl S, Sanchez CP, Lanzer M: Erratum: SC83288 is a clinical development candidate for the treatment of severe malaria. **Nature communications 2017**; 8, 15273

Cyrklaff M, Srismith S, Nyboer B, Burda K, Hoffmann A, Lasitschka F, Adjalley S, Bisseye C, Simpore J, Mueller AK, Sanchez CP, Frischknecht F, Lanzer M: Oxidative insult can induce malaria-protective trait of sickle and fetal erythrocytes. **Nature communications 2016**; 7, 13401

Rieger H, Yoshikawa HY, Quadt K, Nielsen MA, Sanchez CP, Salanti A, Tanaka M and Lanzer M: Cytoadhesion of Plasmodium falciparum-infected erythrocytes to chondroitin-4-sulfate is cooperative and shear enhanced. **Blood 2015**; 125: 383-391

Sanchez CP, Liu CH, Mayer S, Nurhasanah A, Cyrklaff M, Mu J, Ferdig MT, Stein WD and Lanzer M: A HECT ubiquitin-protein ligase as a novel candidate gene for altered quinine and quinidine responses in Plasmodium falciparum. **PLoS Genet 2014**; 10: e1004382

Summers RL, Dave A, Dolstra TJ, Bellanca S, Marchetti RV, Nash MN, Richards SN, Goh V, Schenk RL, Stein WD, Kirk K, Sanchez CP, Lanzer M and Martin RE: Diverse mutational pathways converge on saturable chloroquine transport via the malaria parasite's chloroquine resistance transporter. **PNAS 2014**; 111: E1759-1767

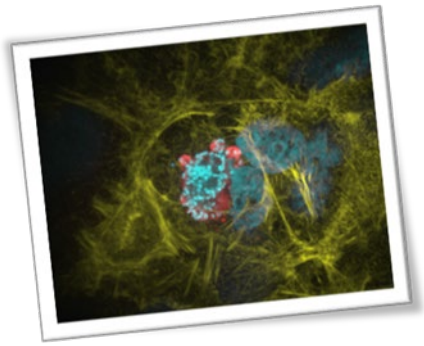
Cyrklaff M, Sanchez CP, Kilian N, Bisseye C, Simpore J, Frischknecht F and Lanzer M: Hemoglobins S and C interfere with actin remodeling in Plasmodium falciparum-infected erythrocytes. **Science 2011**; 334: 1283-1286

Rohrbach P, Sanchez CP, Hayton K, Friedrich O, Patel J, Sidhu AB, Ferdig MT, Fidock DA and Lanzer M: Genetic linkage of pfmdr1 with food vacuolar solute import in Plasmodium falciparum. **Embo J 2006**; 25: 3000-3011

del Portillo HA, Fernandez-Becerra C, Bowman S, Oliver K, Preuss M, Sanchez CP, Schneider NK, Villalobos JM., Rajandream MA, Harris D, Pereira da Silva LH, Barrell B and Lanzer M: A superfamily of variant genes encoded in the subtelomeric region of Plasmodium vivax. **Nature 2001**; 410: 839-842

Scherf A, Hernandez-Rivas R, Buffet P, Bottius E, Benatar C, Pouvelle B, Gysin J and Lanzer M: Antigenic variation in malaria: in situ switching, relaxed and mutually exclusive transcription of var genes during intra-erythrocytic development in Plasmodium falciparum. **Embo J 1998**; 17: 5418-5426

Lanzer M, de Bruin D and Ravetch JV: Transcriptional differences in polymorphic and conserved domains of a complete cloned P. falciparum chromosome. **Nature 1993**; 361: 654-657



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Scientific Vita

2005-present: Group Leader, Center of Infectious Diseases, Parasitology, Heidelberg University Hospital

2001-2005: Postdoc, Institut Pasteur, Paris, France

2000: PhD, FU Berlin (summa cum laude)

1996-2000: PhD thesis, EMBL, Heidelberg

1995-1996: Research student, Lab of Molecular Biology, Cambridge, UK

1990-1996: Studies of Biochemistry (FU Berlin)

Specific Research Interests

- Cell biology and biophysics of pathogen infection
- Malaria cell biology

- Cell motility

Selected Publications

Patra P, Beyer K, Jaiswal A, Battista A, Rohr K, Frischknecht F and Schwarz US: Collective migration reveals mechanical flexibility of malaria parasites. **Nature Physics 2022**; 18, 586-594

Kehrer J, Formaglio P, Muthinja JM, Weber S, Baltissen D, Lance C, Ripp J, Grech J, Meissner M, Funaya C, Amino R and Frischknecht F: Plasmodium sporozoite disintegration during skin passage limits malaria parasite transmission. **EMBO Rep. 2022**; 23(7):e54719

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Douglas RG, Amino R, Sinnis P, Frischknecht F: Active migration and passive transport of malaria parasites. **Trends Parasitol 2015**; 31,357-62

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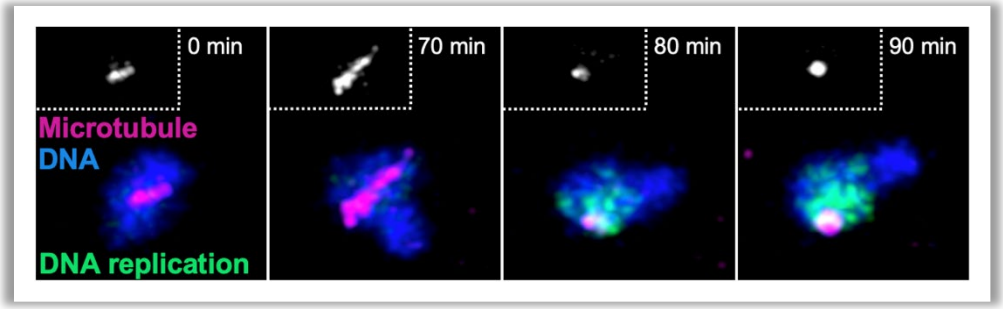

Scientific Vita

2016-present: Junior Group Leader, Department of Infectious Diseases, Parasitology, Heidelberg University Hospital, Heidelberg

2010-2016: PostDoc, Harvard University, Cambridge, MA, USA

2009-2010: PostDoc, Max Planck Institute for Infection Biology, Berlin

2000-2005: Studies of Biology, Heidelberg University, Heidelberg

Specific Research Interests

- Molecular parasitology
- Malaria cell biology of replication
- Cell cycle regulation
- Reverse genetics and inducible knockdown technology
- Advanced imaging and proteomics

Selected Publications

Klaus S, Binder P, Kim J, Machado M, Funaya C, Schaaf V, Klaschka D, Kudulyte A, Cyrklaff M, Laketa V, Hoefer T, Guizetti J, Becker N, Frischknecht F, Schwarz US, Ganter M: Asynchronous nuclear cycles in multinucleated Plasmodium falciparum enable rapid proliferation. **Science Advances 2022**; 8(13):eabj5362 PMID:35353560

Schumann R, Bischoff E, Klaus S, Möhring S, Flock J, Keller S, Remans K, Ganter M, Deponte M: Protein abundance and folding rather than the redox state of Kelch13 determine the artemisinin susceptibility of Plasmodium falciparum. **Redox Biology 2021**; 48: 102177 PMID:34773836

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Paul AS, Saha S, Jiang RHY, Coleman BI, Kosber AL, Chen C, Ganter M, Espy N, Gubbels MJ, Duraisingh MT. Parasite calcineurin regulates host cell recognition and attachment by apicomplexans. **Cell Host Microbe 2015**; 18, 49-60

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Dr. Julien Guizetti

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Scientific Vita

2017-present: Group leader at Heidelberg University Hospital investigating nuclear division mechanisms in human malaria parasites.

2017: Visiting researcher at Siegel lab, University Würzburg (Germany).

2011-2016: Postdoc as HFSP fellow Scherf lab, Institut Pasteur, Paris (France).

2011: One-month volunteering project, Sironko, (Uganda).

2007-2011: PhD project at Gerlich lab, ETH Zurich (Switzerland).

2006: Diploma thesis project at Vogel lab, McGill University, Montreal (Canada).

2003 – 2005: Studies in Biotechnology, ESBS university, Strasbourg (France).

2001 – 2003: Studies in Biology, University Karlsruhe (Germany).

Specific Research Interests

- Molecular parasitology
- Cell division mechanisms of malaria parasite
- Cellular dynamics of mitotic factors
- Super-resolution and electron microscopy methods
- Genome editing of human blood stage malaria parasites
- Host-pathogen interactions and antigenic variation

Selected Publications

Klaus S, Binder P, Kim J, Machado M, Funaya C, Schaaf V, Klaschka D, Kudulyte A, Cyrklaff M, Laketa V, Höfer T, Guizetti J, Becker NB, Frischknecht F, Schwarz US and Ganter M: Asynchronous nuclear cycles in multinucleated Plasmodium falciparum facilitate rapid proliferation. **Sci Adv 2022**; (13):eabj5362

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Simon CS, Stürmer VS & Guizetti J: How Many Is Enough? - Challenges of Multinucleated Cell Division in Malaria Parasites. **Front Cell Infect Microbiol 2021**; 11, 658616

Mehnert AK, Simon CS and Guizetti J: Immunofluorescence staining protocol for STED nanoscopy of Plasmodium-infected red blood cells. **Mol Biochem Parasitol. 2019**; 229, 47-52

Bryant JM, Regnault C, Scheidig-Benatar C, Baumgarten S, Guizetti J* and Scherf A: CRISPR/Cas9 Genome Editing Reveals That the Intron Is Not Essential for var2csa Gene Activation or Silencing in Plasmodium falciparum. **MBio 2017**; 8(4) pii: e00729-17

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Guizetti J* and Scherf A: Silence, activate, poise and switch! Mechanisms of antigenic variation in Plasmodium falciparum. **Cell Microbiol 2013**; 15, 718-726

Guizetti J, Schermelleh L, Mantler J, Maar S, Poser I, Leonhardt H, Muller-Reichert T and Gerlich DW: Cortical constriction during abscission involves helices of ESCRT-III-dependent filaments. **Science 2011**; 331, 1616-1620

Guizetti J, Mantler J, Muller-Reichert T and Gerlich DW: Correlative time-lapse imaging and electron microscopy to study abscission in HeLa cells. **Methods Cell Biol 2010**; 96, 591-601

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Scientific Vita

2020-present: DZIF Group Leader, Parasitology Unit, Heidelberg University Hospital

2017-2020: MRC Skills Development Fellow, Vector Biology, Liverpool School of Tropical Medicine, UK

2018: Visiting Scientist, The Broad Institute, Boston, USA

2017: Visiting Scientist, Harvard TH Chan School of Public Health, Boston, USA

2016-2017: Post-Doctoral Research Associate, Vector Biology, Liverpool School of Tropical Medicine, UK

2012-2016: PhD, University of Warwick, UK

2011-2012: MSc Systems Biology, University of Warwick, UK

2008-2011: MA Biological Sciences, University of Oxford, UK

- Molecular mechanisms of insecticide resistance
- Vector – parasite interactions
- Transcription factor control
- Transcriptomics and Genomics
- Integration of informatics with molecular biology

Selected Publications

Ingham VA, Elg S, Nagi SC, Dondelinger F: Capturing the transcription factor interactome in response to sub-lethal insecticide exposure. **bioRxiv 2020**; 39969

Ingham VA, Brown F, Ranson H: Sub-lethal pyrethroid exposure and ageing lead to pronounced changes in gene expression in insecticide resistance Anopheles coluzzii. **bioRxiv 2020**; 250852

Brown F, Paton DG, Catteruccia F, Ranson H and Ingham VA: Steroid hormone agonists reduce female fitness in insecticide-resistant Anopheles populations. **Insect Biochem Mol Biol 2020**; 121:103372

Ingham VA, Bennett A, Peng D, Wagstaff SC, Ranson H: IR-TEx: An open source data integration tool for big data transcriptomics designed for the major malaria vector *Anopheles gambiae*. **J Vis Exp 2020**; 155

Minetti C, Ingham VA, Ranson H: Effects of insecticide resistance and exposure on *Plasmodium* development in *Anopheles* mosquitoes. **Curr Opin Insect Sci 2020**; 39:42-49

Ingham VA, Anthousi A, Douris V, Harding NJ, Lycett G, Morris M, Vontas J, Ranson H: A sensory appendage protein protects malaria vectors from pyrethroids. **Nature 2020**; 577(7790):376-380

Ingham VA, Wagstaff S and Ranson H: Transcriptomic meta-signatures identified in *Anopheles gambiae* populations reveal previously undetected insecticide resistance mechanisms. **Nat Commun 2018**; 9:5282

Ingham VA, Pignatelli P, Moore JD, Wagstaff S, Ranson H: The transcription factor *Maf*-S regulates metabolic resistance to insecticides in the malaria vector *Anopheles gambiae*. **BMC Genomics 2017**; 30;18(1):669

Pignatelli P, Ingham VA, Balabanidou V, Vontas J, Lycett G, Ranson H: The *Anopheles gambiae* ATP-binding cassette transporter family: phylogenetic analysis and tissue localization provide clues on function and role in insecticide resistance. **Insect Mol Biol 2018**; 27(1):110-122

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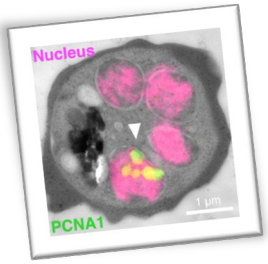

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Scientific Vita

2021-present: Junior Group Leader at MCTU, Center for Infectious Diseases-Parasitology Heidelberg University Hospital, Heidelberg / Chief Scientific Officer / Sumaya-Biotech

2018-2022: PhD, Biochemistry, Molecular Biology and Biomedicine, Universidad Complutense de Madrid, Spain, Madrid

2017-2021: Marie Sklodowska Curie- Postdoctoral Fellow, Center for Infectious Diseases-Parasitology Heidelberg University Hospital, Heidelberg

2014-2017: Research Associate, University of South Florida College of Public HealthTampa, Florida, USA

2013-2014: GSK OpenLab Fellowship. Fundaçao de Medicina Tropical Heitor Vieira Dourado (FMT-HVD) Manaus, Amazonas, Brasil

2007-2010: Master of Science (MSc), Structure and function of proteins, Biochemistry and Molecular Biology, Universitat Autònoma of Barcelona, Spain

2007–2010 Emergency Lab Staff Hospital Universitari Germans Trías i Pujol, Barcelona, Spain

2003-2007: MD Residency Clinical Biochemistry HUGTiP, Barcelona, Spain

2001-2002: Master of Science (MSc), Tropical Medicine and International Health, Universitat Autònoma of Barcelona, Spain

1995-2001: Studies in Medicine and Surgery, University of Málaga, Spain

Specific Research Interests

- Malaria cell biology and physiopathology
- Immunology and vaccine development
- Plasmodium vivax malaria
- Reticulocytes and erythropoiesis

Selected Publications

Thomson-Luque R, Votborg-Novél L, Ndovie W, Andrade CM, Niangaly M, Attipa C, Lima NF, Coulibaly D, Doumtabe D, Guindo B, Tangara B, Maiga F, Kone AK, Traore K, Kayentao K, Ongoiba A, Doumbo S, Thera MA, Traoré B, Seydel K, Osório NS and Portugal S: Plasmodium falciparum transcription in different clinical presentations of malaria associates with circulation time of infected erythrocytes. **Nat Commun. 2021**; 12(1):4711

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Andrade CM, Fleckenstein H, Thomson-Luque R, Doumbo S, Lima NF, Anderson C, Hibbert J, Hopp CS, Tran TM, Li S, Niangaly M, Cisse H, Doumtabe D, Skinner J, Sturdevant D, Ricklefs S, Virtaneva K, Asghar M, Homann MV, Turner L, Martins J, Allman EL, N'Dri ME, Winkler V, Llinás M, Lavazec C, Martens C, Färnert A, Kayentao K, Ongoiba A, Lavstsen T, Osório NS, Otto TD, Recker M, Traore B, Crompton PD and Portugal S: Increased circulation time of Plasmodium falciparum underlies persistent asymptomatic infection in the dry season. **Nat Med. 2020**; (12):1929-1940

Thomson-Luque R, Wang C, Ntumngia CB, X S, Szekeres K, Conway A, Adapa SR, Barnes SJ, Adams JH and Jiang RHY: In depth phenotypic characterization of reticulocyte maturation using mass cytometry. **Blood Cells Mol Dis 2018**; 72:22-33

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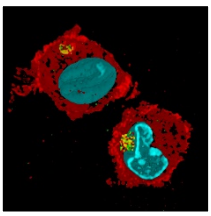
Ntumngia FB, Pires CV, Barnes SJ, George MT, Thomson-Luque R, Kano FS, Alves JRS, Urusova D, Pereira DB, Tolia NH, King CL, Carvalho LH and Adams JH: An engineered vaccine of the Plasmodium vivax Duffy binding protein enhances induction of broadly neutralizing antibodies. **Sci Rep 2017**; 7(1):13779

Thomson-Luque R, Saliba KS, Kocken CH and Pasini EM: A Continuous, Long-Term Plasmodium Vivax In Vitro Blood-Stage Culture: What Are We Missing? **Trends Parasitol 2017**; 33(12):921-924

Ntumngia FB, Thomson-Luque R, Torres L de M, Gunalan K, Carvalho LH and Adams JH: A Novel Erythrocyte Binding Protein of Plasmodium vivax Suggests an Alternate Invasion Pathway into Duffy-Positive Reticulocytes. **mBio. 2016**; 7(4):e01261-16

Shaw-Saliba K*, Thomson-Luque R*, Obaldía N, Nuñez M, Dutary S, Lim C, Barnes S, Kocken CHM, Duraisingh MT, Adams JH and Pasini EM: Insights into an Optimization of Plasmodium vivax Sal-1 In Vitro Culture: The Aotus Primate Model. **PLoS Negl Trop Dis. 2016**; 10(7):e0004870

Infectious Diseases
IMAGING PLATFORM



Fields of Interest

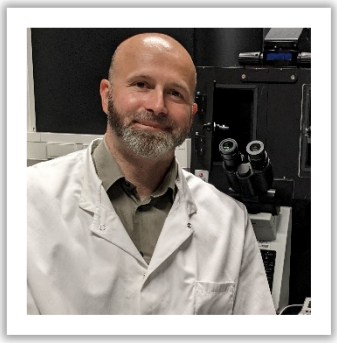
The physiology of host-pathogen interactions is governed by individual, stochastic and often rare molecular events. For example, latent HIV infections occur only in one in a million CD4+ T cells in vivo, HCV will only replicate in one out of hundred thousand hepatocyte-derived cells etc. Although, classical biochemical, genetic and genomic approaches have been employed over the years to yield important insights in host-pathogen interactions, most of these experimental approaches are population-based ("bulk"), end-point analyses where obtained information represents an average across the population and where important parameters can be missed as they become "averaged out" in the bulk measurement. To truly understand the differences between the health and the disease state, we need to employ an experimental approach that is able to identify and quantitatively examine these individual molecular events. With the recent technological innovations, microscopy has emerged as an ideal approach to accomplish this task.

Besides providing the required spatial resolution, modern microscopy is able to quantitatively assess complex dynamics of a biological system and provide the most realistic representation of a living system. For this reason, we established Infectious Disease Imaging Platform (IDIP) – an advanced light microscopy infrastructure placed under enhanced biosafety containment (BSL2 and BSL3).The infrastructure consists of 15+ microscopy systems, 5 instruments for electron microscopy sample preparation, FACS, tailored IT infrastructure as well as sample preparation area, image analysis infrastructure and dedicated expert personnel. This comprehensive microscopy infrastructure enables imaging of pathogens across a wide range of spatiotemporal scales and organizational levels of complexity under close-to-physiological setting.

The Infectious Diseases Imaging Platform is run by:

-Dr. Vibor Laketa

Dr. Vibor Laketa



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Scientific Vita

2018-present Head of Infectious Disease Imaging Platform (IDIP), Center for Integrative Infectious Diseases Research (CIID), University Hospital Heidelberg

2013-present Imaging platform coordinator in German Center for Infection Research (DZIF), Heidelberg, Germany

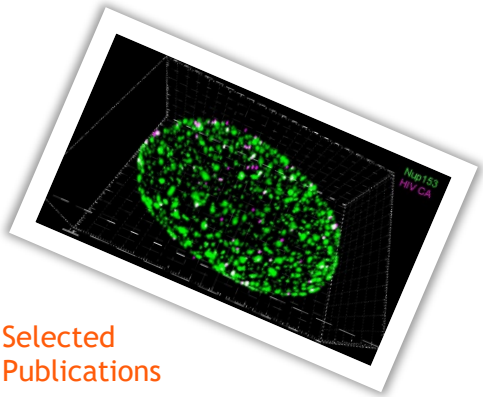
2008-2013 Staff Scientist, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany

2006-2008 PostDoc, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany

2002-2006 Dr. rer. nat. (summa cum laude), European Molecular Biology Laboratory (EMBL) and Heidelberg University, Germany

1997-2002 MSc. Molecular Biology, University of Zagreb, Croatia and Ludwig Institute for Cancer Research, Uppsala, Sweden

- Advanced light and electron microscopy infrastructure to examine patho-physiological processes in infectious diseases at different spatiotemporal scales and organizational complexities
- Development of automated microscopy workflows for data acquisition, processing and analysis
- Development of microscopy-based assays and procedures used in infectious disease research, drug screening and diagnostics



Selected Publications

Heuss C, Rothhaar P, Burm R, Lee JY, Ralfs P, Haselmann U, Ströh LJ, Colasanti O, Tran CS, Schäfer N, Schnitzler P, Merle U, Bartenschlager R, Patel AH, Graw F, Krey T, Laketa V, Meuleman P, Lohmann V: A Hepatitis C virus genotype 1b post-transplant isolate with high replication efficiency in cell culture and its adaptation to infectious virus production in vitro and in vivo. **PLoS Pathog. 2022**; 28;18(6):e1010472

Cortese M, Laketa V: Advanced microscopy technologies enable rapid response to SARS-CoV-2 pandemic. **Cell Microbiol. 2021**; 23(7):e13319

Klein S, Wimmer WH, Winter SL, Kolovou A, Laketa V, Chlanda P: Post-correlation on-lamella cryo-CLEM reveals the membrane architecture of lamellar bodies. **Communications Biology 2021**; 29;4(1):137

Müller TG, Zila V, Peters K, Schifferdecker S, Stanic M, Lucic B, Laketa V, Lusic M, Müller B, Kräusslich HG: HIV-1 uncoating by release of viral cDNA from capsid-like structures in the nucleus of infected cells. **Elife 2021**; 27;10:e64776

Pape C, Remme R, Wolny A, Olberg S, Wolf S, Cerrone L, Cortese M, Klaus S, Lucic B, Ullrich S, Anders-Össwein M, Wolf S, Cerikan B, Neufeldt CJ, Ganter M, Schnitzler P, Merle U, Lusic M, Boulant S, Stanifer M, Bartenschlager R, Hamprecht FA, Kreshuk A, Tischer C, Kräusslich HG, Müller B, Laketa V: Microscopy-based assay for semi-quantitative detection of SARS-CoV-2 specific antibodies in human sera. **Bioessays 2021**; 43(3):e2000257

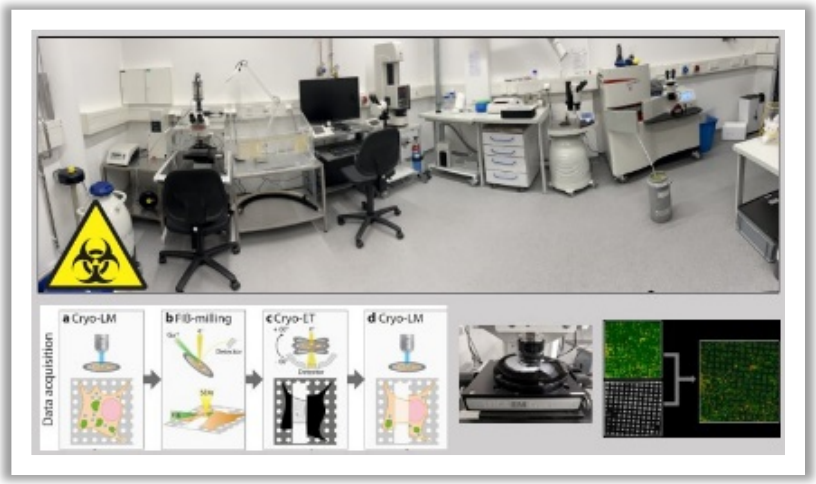
Pahmeier F, Neufeldt CJ, Cerikan B, Prasad V, Pape C, Laketa V, Ruggieri A, Bartenschlager R, Cortese M: A Versatile Reporter System to Monitor Virus-Infected Cells and Its Application to Dengue Virus and SARS-CoV-2. **J Virol 2021**; 28;95(4):e01715-20

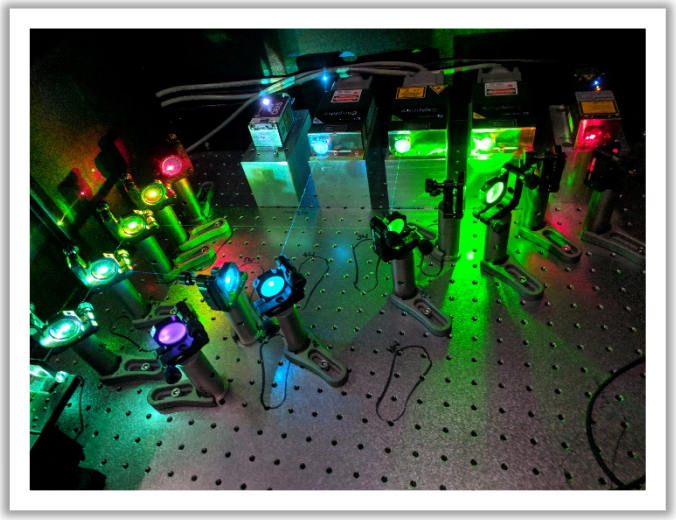
Cortese M, Lee JY, Cerikan B, Neufeldt CJ, Oorschot VMJ, Köhrer S, Hennies J, Schieber NL, Ronchi P, Mizzon G, Romero-Brey I, Santarella-Mellwig R, Schorb M, Boermel M, Mocaer K, Beckwith MS, Templin RM, Gross V, Pape C, Tischer C, Frankish J, Horvat NK, Laketa V, Stanifer M, Boulant S, Ruggieri A, Chatel-Chaix L, Schwab Y, Bartenschlager R: Integrative Imaging Reveals SARS-CoV-2-Induced Reshaping of Subcellular Morphologies. **Cell Host Microbe 2020**; 9;28(6):853-866

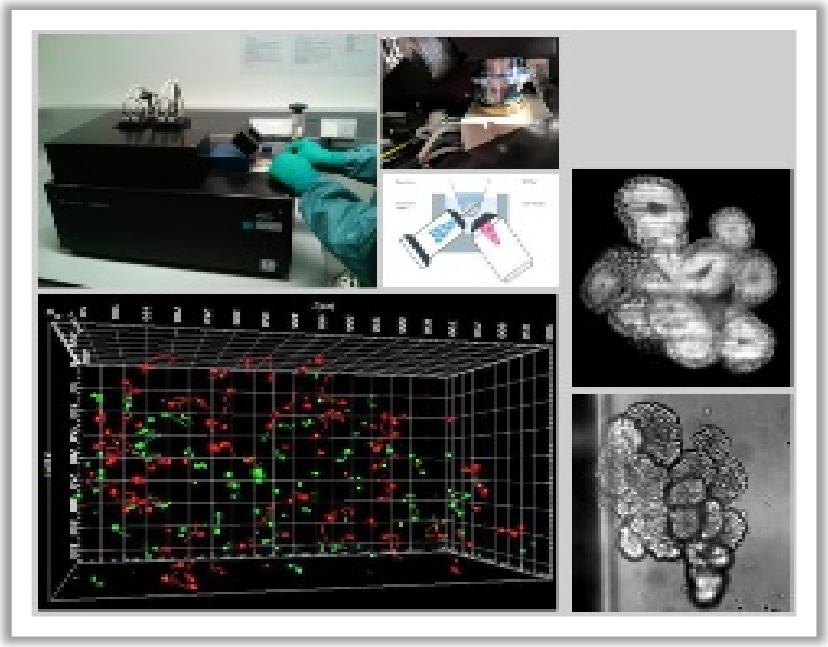
Tsopoulidis N, Kaw S, Laketa V, Kutscheidt S, Baarlink C, Stolp B, Grosse R, Fackler OT: T cell receptor-triggered nuclear actin network formation drives CD4+ T cell effector functions. **Sci Immunol 2019**; 4;4(31):eaav1987

Laketa V: Microscopy in Infectious Disease Research-Imaging Across Scales. **J Mol Biol 2018**; 17;430(17):2612-2625

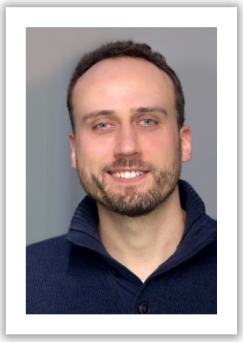
Laketa V, Zarbakhsh S, Traynor-Kaplan A, Macnamara A, Subramanian D, Putyrski M, Mueller R, Nadler A, Mentel M, Saez-Rodriguez J, Pepperkok R, Schultz C: PIP_3 induces the recycling of receptor tyrosine kinases. **Sci Signal 2014**; 14;7(308):ra5







List of the Associated Research Groups Major Infectious Diseases



Dr. Marco Binder

Research Group "*Dynamics of early viral infection and the innate antiviral response*"
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Specific Research Interests

- Cell intrinsic immune defense and inflammatory signaling pathways
- Regulation and dynamics of signaling events
- Dynamics of RNA-virus replication
- Virus-host interactions in innate immunity
- Systems biology and mathematical modeling

apl. Prof. Dr. Martin Müller

Research Group "*Tumorvirus-specific vaccination strategies*"

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Specific Research Interests

- Prophylactic and therapeutic vaccination against human papillomaviruses (HPV)
- Scaffolds for vaccine antigens
- Natural and vaccine induced immunity against HPV
- Host cell restriction and dependency factors for adeno-associated viruses (AAV) and HP

PD Dr. Ellen Krautkrämer

Research Group "*Hantavirus pathogenesis*"
Nephrology, INF 162, 69120 Heidelberg, University of Heidelberg
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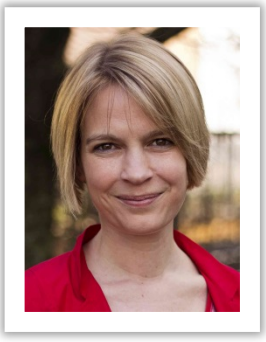
Email: ellen.krautkraemer@med.uni-heidelberg.de
Web: http://nierenzentrum-heidelberg.com

Specific Research Interests

- Replication cycle of hantaviruses in renal cells
- Clinical characteristics of hantavirus infection
- Mechanisms of hantavirus-induced cellular damage and renal failure



PD Dr. Dr. Angelika Riemer

Research Group "*Immunotherapy and Immunoprevention*"
F130, INF 242; 69120 Heidelberg
Phone: +49 6221 423820
Email: a.riemer@dkfz.de

Specific Research Interests

- Therapeutic cancer vaccines, especially against HPV-mediated malignancies
- Direct (MS-based) detection of CTL target epitopes on the surface of infected or transformed cells
- Therapeutic vaccine design and formulation
- Directing vaccination-induced T cells to certain body sites
- HPV-induced changes in antigen processing and presentation

apl. Prof. Dr. Martin Löchelt

Research Group "*Molecular Biology and Application of Recombinant Foamy Viruses*"
F020, INF 280, 69120 Heidelberg
Phone: +49 6221 424933
Email: m.loechelt@dkfz.de
Web:http://www.dkfz.de/en/f020/groups/loechelt/index.html

Specific Research Interests

- Spuma Retroviruses (Foamy Viruses)
- Vaccine vector development
- Virus-host interaction in virus replication in vitro and in vivo
- Retrovirus assembly, morphogenesis and release
- APOBEC3 proteins: antiviral restriction factors and cancer genome mutators

Prof. Dr. Felix Hoppe-Seyler

Virus-Associated Cancers"
F065, INF 242, 69120 Heidelberg
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Email: hoppe-seyler@dkfz.de
Web: https://www.dkfz.de/en/f065/

Specific Research Interests

- Human papillomavirus (HPV)-linked cancers: Transformation mechanisms and novel therapeutic strategies
- Crosstalk between HPVs and the host cell metabolism (hypoxia, iron and glucose metabolism)
- Cell biology of HPV-positive cancer cells: Regulation of senescence and apoptosis
- Signal transduction

Prof. Dr. Hedda Wardemann

Research Group "B Cell Immunology / B-Zell-Immunologie" (D130)
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Phone: +49 6221 42 1270
Email: h.wardemann@dkfz-heidelberg.de
Web: https://www.dkfz.de/en/b-zell-immunologie/index.php

Specific Research Interests

- Human immune responses against Plasmodium falciparum
- Malaria vaccine development
- Immunological memory to infection and vaccination
- Antigen-receptor diversity and quality of immune responses

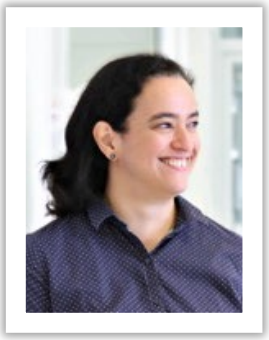
Dr. Erec Stebbins

Research Group "Structural Biology of Infection and Immunity" (D160)

Phone:+49 6221 421380
Email: e.stebbins@dkfz-heidelberg.de
Web: https://www.dkfz.de/en/strukturbiologie-infektion-immunitaet/index.php

Specific Research Interests

- Microbial pathogens as they relate to immunology and human carcinogenesis
- Structural biology/X-ray crystallography
- The African trypanosome (*T. brucei*), the causative agent of sleeping sickness
- Genotoxins or agents impacting oncogenic growth regulatory factors in the cell



Prof. Dr. F. Nina Papavasiliou

Research Group "Immune Diversity" (D150)
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Web:https://www.dkfz.de/en/immundiversitaet/index.php

Specific Research Interests

- Surface receptor diversification in the African trypanosome (*T. brucei*), the causative agent of sleeping sickness
- The interface between host immunity (antibodies) and the ever changing coat composition of *T. brucei* (also known as antigenic variation)
- Informational diversity through epitranscriptomic mechanisms in host immune cells

Prof. Dr. Yvonne Samstag

Section Molecular Immunology

Phone: +49 6221 56 4039
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Web: http://www.klinikum.uni-heidelberg.de/Sektion-Molekulare-Immunologie.2831.0.html

Specific Research Interests

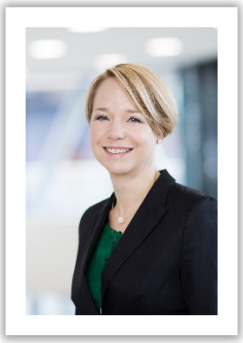
- Regulation of immune responses by the micromilieu (human and mouse models)
- Co-stimulatory signaling in T lymphocytes, cytoskeletal remodeling and redox regulation
- Regulation and function of granulocytes
- Allergy and chronic inflammatory diseases (SFB TRR 156)
- Tumor immunology and immune therapy (CAR T-cells, Checkpoint inhibitors)
- Tumor migration and metastasis
- Immunomodulation by plant-derived substances (www.azkim.de, www.cimresearch.org)
- High resolution imaging, InFlow microscopy

Dr. Frederik Graw

Research Group "Modelling Infection & Immunity"
BioQuant-Center for Quantitative Biology
INF 267, 69120 Heidelberg
Phone: +49 6221 54 51309
Email: frederik.graw@bioquant.uni-heidelberg.de
Web: http://www.bioquant.uni-heidelberg.de/research/groups/modelling-infection-immunity.html

Specific Research Interests

- Mathematical modeling of host-pathogen interactions
- Spatio-temporal dynamics of infection and immune processes
- Viral spread within tissues
- Immune cell differentiation and vaccine design



Prof. Dr. Stella E. Autenrieth

Research Group "Dendritic Cells in Infection and Cancer"
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Web: https://www.dkfz.de/en/virus-assoziierte-karzinogenese/groups/AGAutenrieth/index.html?m=1656929068&

Specific Research Interests

- Immunobiology of dendritic dells (DCs)
- DC development in the context of infection and cancer
- Spectral flow cytometry and unsupervised data analysis
- Immunophenotyping in clinical trials

Prof. Dr. Dr. Christine E. Engeland

Research Group "Mechanisms of Oncolytic Immunotherapy"
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or

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Specific Research Interests

- viral vectors for cancer immunotherapy and vaccination
- measles virus (vaccines) and paramyxoviruses
- virus-host interactions

Prof. Dr. Adelheid Cerwenka

Angeborene Immunität
Centrum für Biomedizin und Medizintechnik Mannheim, Ludolf Krehl-Straße 13-17
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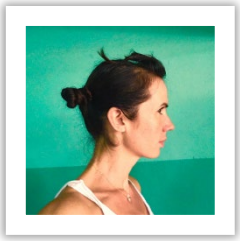
Web: https://www.umm.uni-heidelberg.de/forschung/forschungsschwerpunkte/onkologie/mitglieder/prof-dr-adelheid-cerwenka/

Specific Research Interests

- Molecular mechanism of NK/ILC activation
- Functional Diversification of NK cells
- Interaction of NK/ILCs with other Immune Cells, Endothelial Cells and virus-infected Liver Cells
- novel NK Cell-based Immunotherapies and Combination Therapies in preclinical Mouse Models

Former group leaders of the Major Infectious Diseases

!Practicals/master theses that are completed in these working groups are considered external and must be applied for separately!

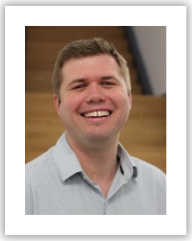


Dr. Silvia Portugal

Max-Planck-Institut für Infektionsbiologie
Charitéplatz 1; Campus Charité Mitte
10117 Berlin, Germany
Web: https://www.mpiib-berlin.mpg.de/2019364/malaria-parasite-biology

Specific Research Interests

- *Plasmodium* seasonal transmission
- Survival mechanisms of *P. falciparum* when no vectors are available
- Immune response to asymptomatic *P. falciparum* infections
- *Plasmodium* virulence and variant surface antigens
- *Plasmodium* gametocytogenesis dynamics throughout the dry season
- Transmission capacity of *P. falciparum* kept asymptomatically during the dry season



Dr. Ross G. Douglas

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Heinrich-Buff-Ring 26-32
35392 Giessen
Phone: +49 641 99 39145
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Specific Research Interests

- *Plasmodium* cytoskeleton dynamics

Dr. Pierre-Yves Lozach

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Web: www.lozachlab.com

Specific Research Interests

- amyloid fibril proteins

- cell biology of virus entry
- early virus–host cell interactions
- emerging zoonotic viruses
- molecular factors responsible for viral virulence
- viral fusion
- virus–receptor interactions

Prof. Dr. Jude Przyborski

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Web: https://www.uni-giessen.de/fbz/fb09/institute/ernaehrungswissenschaf

Specific Research Interests

- Malaria
- Chaperones
- Evolution
- Protein traffic
- Protein folding

Prof. Dr. Faith Osier

IAVI Human Immunology Laboratory
Chelsea & Westminster NHS Foundation Trust

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Web: https://www.imperial.ac.uk/infectious-disease/research/immunology-infection/human-immunology/

Specific Research Interests

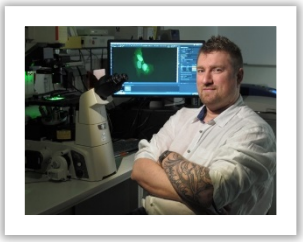
- Human immunity to *Plasmodium falciparum* malaria
- Parasite-host interactions
- Vaccine Development for malaria
- Epidemiology & Molecular biology of infectious diseases

Dr. Megan Stanifer

Department of Molecular Genetics and Microbiology
Gainesville, Florida, USA
Email: m.stanifer@ufl.edu
Web: http://mgm.ufl.edu/profile/stanifer-megan/

Specific Research Interests

- Response of epithelial cells (lung and gut) to virus infections
- Role of type I and III interferons in controlling virus infection at mucosal surfaces
- Evaluating single cell immune responses to virus infection
- Establishing microfluidics to better mimic the host cell environment



Dr. Steeve Boulant

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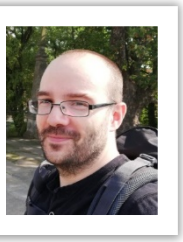
Phone: 352-273-6380
Email: s.boulant@ufl.edu
Web: https://www.boulantlab.com/
http://mgm.ufl.edu/faculty/

Specific Research Interests

- Enteric viruses (*Astrovirus*, *Rotavirus*, *Norovirus*)
- Human Intestinal organoids
- Response of human intestinal epithelial cell to enteric viruses
- Mechanisms of enteric virus pathogenesis
- Single cell sequencing characterization of host/pathogen interaction
- Importance of low oxygen conditions (hypoxia) in regulating gut homeostasis
- System virology



Dr. Sébastien Boutin

Klinik für Infektiologie und Mikrobiologie
Universität zu Lübeck
Phone: +4945131019030
Email: sebastien.boutin@uni-luebeck.de
Web: tba

Specific Research Interests

- Human microbiome
- Airways infection
- Host-microbes interactions
- Next-generation sequencing

Prof. Dr. med. Dennis Nurjadi

Klinik für Infektiologie und Mikrobiologie

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Email: dennis.nurjadi@uni-luebeck.de
Web: tba

Specific Research Interests

- Immune mechanisms and pathogen-host interaction of *Staphylococcus aureus* colonization and infection
- Molecular mechanisms and epidemiology of antimicrobial resistance in clinically relevant pathogens
- NGS-based strain typing and (bacterial) outbreak diagnostics
- Clinical studies in infectious diseases

Students of the Major ‘Infectious Diseases’ WS 2016-2017

From left to right, in the back: Yannik Voß, Léanne Strauß, Jasmin Dehnen, Tammy Lan, Christian Sommerauer, Moritz König. In the middle: Micha Rosenkranz, Thomas Kehrer, Emma Pietsch, Franziska Kraus, Benjamin Lang, Silke Schmidt, Anna Huhn. In the front: Sabina Ganskih, Julia Heinze.

Students of the Major ‘Infectious Diseases’ WS 2017-2018

From left to right, in the back: Martin Kampmann, Patrick Küber, Annika Binder, Ann-Kathrin Mehnert, Nora Heber, Philipp Ehmann, Simay Ayhan. In the front: Camila Metz, Katharina Morath, Michelle Yee, Hannah van Dijk

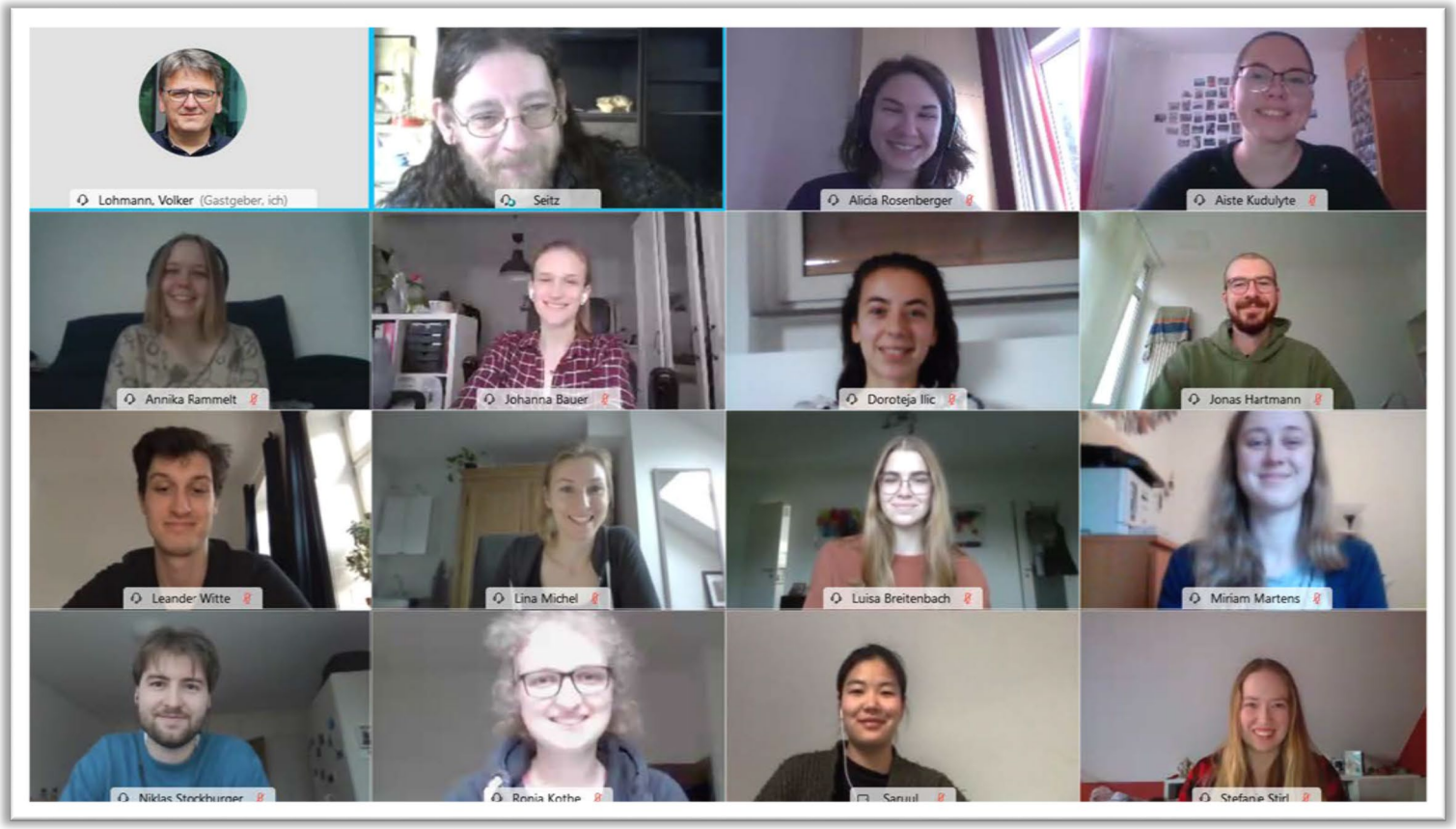
Students of the Major ‘Infectious Diseases’ WS 2018-2019

From left to right, in the back: Stefan Diehl, Nikolay Sergeev, Valerii Martynov, Noah Ruf, Jose Luis Guzman Martin, Felix Pahmeier. In the front: Chia Ching Wu, Hao-En Huang, Dorothee Reuß, Laura Emig, Lisa Augstein, Carmen Lahr, Marta Freixas Teres

Students of the Major ‘Infectious Diseases’ WS 2019-2020

From left to right, in the back: Carl-Niklas Schneider, Romy Brecht, Nathan Ribot, Christoph Wenz, Vidmante Visockaite. In the front: Mariana Ríos Vázquez, Antonia Louisa Boehmert, Koleta Michalek, Sara Kraker, Paulina Schad, Sarah Peterl, Charlotte Kamm.

Students of the Major ‘Infectious Diseases’ WS 2020-2021



From left to right and from top to bottom: Alicia Rosenberger, Aiste Kudulyte, Annika Rammelt, Johanna Bauer, Doroteja Ilic, Jonas Hartmann, Leander Witte, Lina Michel, Luisa Breitenbach, Miriam Martens, Niklas Stockburger, Ronja Kothe, Saruul Jargalsaikhan, Stefanie Stirl.

Students of the Major ‘Infectious Diseases’ WS 2021-2022

From left to right, in the back: En-Jui Cho, Maren Gehringer, Vera Lechner, Claudia Bastl, Pia Hüber. In the front: Argyris Satikidis, Simon Kneilmann, Sophie Stopper, Lea Juliane Woltereck, Katharina Röver.

Students of the Major ‘Infectious Diseases’ WS 2022-2023

From left to right, in the back: Roberta Malamud, Lena Müller, Marie Rose Schrimpf, Jens Timmer, Lilian Patrick Dorner. In the front: Cheyenne Seeger, Li-Yao Chen, Carla Siebenkotten, Colin Philip Förster, Michelle Georgi, Niclas Maier.