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 diseases continue to be a major threat for human health. Not only well known diseases like malaria, AIDS or chronic hepatitis, but also gastrointestinal diseases continue to be a major threat for human health. Not only well known diseases like malaria, AIDS or chronic hepatitis, but also gastrointestinal diseases continue to be a major threat for human health. Not only well known diseases like malaria, AIDS or chronic hepatitis, but also gastrointestinal diseases continue to be a major threat for human health.

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 (http://www.trr179.de/), TRR83 (http://www.trr83.de/), TRR239 (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.

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
- Dr. Bachar Cheaib

Scientific Vita

Since 2022: Full Professor (W3) for Medical Microbiology and Hygiene, Medical Director, Medical Microbiology and Hygiene, Dept. of Infectious Diseases, University Hospital Heidelberg

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

1993: 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


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


Scientific Vita

2018: Professorship (apl.) at Heidelberg University

2011: 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

2007-present: Group Leader at the Department of Infectious Diseases, University of Heidelberg

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


apl. Prof. Dr. Katharina Heike-Kubatzky

Department of Infectious Diseases
Medical Microbiology and Hygiene
Im Neuenheimer Feld 324
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 38361
Email: kubatzky@uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/PD-Dr-K-Kubatzky.105261.0.html
Dr. Bachar Cheaib

Department of Infectious Diseases
Medical Microbiology and Hygiene
Im Neuenheimer Feld 324
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 32164
Email: bachar.cheaib@med.uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/medizinische-mikrobiologie-und-hygiene/forschung/research/cheaib

Scientific Vita

2023-present: Group Leader, Department of Infectious Diseases, Medical Microbiology and Hygiene, Heidelberg University hospital

2018-2023: Post-doctoral Research Associate at the University of Glasgow, Scotland, United Kingdom

2013-2018: Ph.D. Institute de Biologie Intégrative et des Systèmes, Université Laval, Québec City, Canada

Specific Research Interests

- Eco-evolutionary basis of host-microbiome colonisation
- Evolutionary medicine and microbial evolution of antimicrobial resistance
- Microbiome Dynamics and ontogenesis of respiratory and digestive tracts
- Host-microbe spatial Omics to reveal the cell-cell communication in the context of infection
- Molecular microbe-microbe interactions from function redundancy to metabolic cross-feeding

Selected Publications


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), Zika virus (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. Dr. h.c. 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

Virology, Heidelberg University, Germany; CHS Stiftungsprofessur “Molekulare Virologie”

2001: Full Professor for Molecular Biology, University of Mainz
1999: Habilitation, University of Mainz
1994-1998: Assistant, University of Mainz
1991-1993: PostDoc, Central Research Unit, Hoffmann-La Roche AG, Basel, Switzerland
1990: PhD in Molecular Biology, Heidelberg University

Scientific Vita

2002-present: Full Professor and head of Department of Infectious Diseases, Molecular Virology, Heidelberg University

Phone: +49-(0)6221-56 4225
Email: ralf.bartenschlager@med.uni-heidelberg.de
Web: www.molecular-virology.uni-hd.de

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


Scientific Vita

Since 2014: Full professor (W3) “Translational Virology” at the Medical Faculty at 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 at the University Hospital Heidelberg

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

2000: Habilitation at the faculty of Biosciences, Heidelberg University

1995-2000: PostDoc Center for Molecular Biology (ZMBH), Heidelberg University (Prof. Dr. H. Schaller)

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

1991: Diploma in Biochemistry, University of Tübingen

Specific Research Interests

- Development of direct acting antivirals on HBV and HDV infection for the therapy of liver diseases
- Development of point of care (POC) test for HDV

Selected Publications


apl. Prof. Dr. Volker Lohmann

Department of Infectious Diseases
Molecular Virology
Im Neuenheimer Feld 344
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 6449
Email: Volker.Lohmann@med.uni-heidelberg.de
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


1987-1982: 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


Dr. Alessia Ruggieri

Department of Infectious Diseases
Molecular Virology
Im Neuenheimer Feld 344
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 7761
Email: Alessia.Ruggieri@med.uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/AG-Ruggieri.135585.o.html

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

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 flavivirus life cycle

Selected Publications


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, 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 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. Dr. h.c. Hans-Georg Kräusslich (Head of the Virology)
- Prof. Dr. Dirk Grimm
- apl. Prof. Dr. Barbara Müller
- Dr. Frauke Mucksch
- Dr. Petr Chlanda
- Dr. Viet Loan Dao Thi

Prof. Dr. Dr. h.c. Hans-Georg Kräusslich

Email: Hans-Georg.Krausslich@med.uni-heidelberg.de

Web: https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/virologie

Scientific Vita

1977–1984: Medical School (LMU Munich)
1985: MD in experimental virology (LMU Munich)
1990: Habilitation, University of Heidelberg
1993–1995: Head of junior department, German Cancer Research Centre, Heidelberg
1996–1999: Director, Leibniz Institute of Virology, Hamburg
1999: Full professor and head of department, Leibniz Institute of Virology, Hamburg
1993–1995: Group leader, German Cancer Research Centre, Heidelberg
1995–1999: Full professor and head of department, Leibniz Institute of Virology, Hamburg
1996–1999: Director, Leibniz Institute of Virology, Hamburg
2000–present: Full professor and head of virology, Heidelberg University
2004–present: Director Department of Infectious Diseases, Heidelberg University
2014–2019: Vice-dean for research Medical Faculty, Heidelberg University
2019–2021: coordinator, German Center of Infectious Disease Research
2019–2023: Dean of the Medical Faculty, Heidelberg University

Department of Infectious Diseases
Virology
Im Neuenheimer Feld 344
University Hospital Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 5001
Specific Research Interests

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

apl. Prof. Dr. Barbara Müller

Department of Infectious Diseases Virology
Im Neuenheimer Feld 344
University Hospital Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 1325
Email: Barbara.Mueller@med.uni-heidelberg.de
Web: http://www.klinikum.uni-heidelberg.de/index.php?id=6550&L=1

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

- Virus-host interactions in the post-entry phase of retroviral replication
- HIV assembly and maturation
- Dynamics of HIV cell entry and HIV particle formation
- Fluorescently labeled virus derivatives

Selected Publications


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


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


Specific Research Interests

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

Specific Research Interests

- Virus-host interactions in the post-entry phase of retroviral replication
- HIV assembly and maturation
- Dynamics of HIV cell entry and HIV particle formation
- Fluorescently labeled virus derivatives

Selected Publications


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


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


Prof. Dr. Dirk Grimm

Department of Infectious Diseases, Virology
BioQuant 0030
Im Neuenheimer Feld 267
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-54 5231
Email: dirk.grimm@bioquant.uni-heidelberg.de
Web: https://grimm-labs.com/

Selected Publications


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

1994: Diploma (Biology), University of Kaiserslautern

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

Specific Research Interests

- Human gene therapy
- Viral and parasitical 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


Dr. Viet Loan Dao Thi

Department of Infectious Diseases, Virology
Im Neuenheimer Feld 344
University Hospital Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 78 65
Email: VietLoan.DaoThi@med.uni-heidelberg.de

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

- Molecular virology, virus-host interaction, virus life cycle
- 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


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

2000-2006: M.S. at Charles University, Prague, Czech Republic

Specific Research Interests

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

Selected Publications

Zimmermann L, Chlanda P: Cryo-electron tomography of viral infection - from applications to biosafety. Curr Opin Virol 2023, PMID: 37348443

Bodmer BS, Vallbracht M, Ushakov DS, Wendt L, Chlanda P, Hoenen T: Ebola virus inclusion bodies are liquid organelles whose formation is facilitated by nucleoprotein oligomerization. Emerg Microbes Infect 2023, 12(2):2223727, PMID: 37306660


Dr. Petr Chlanda

Department of Infectious Diseases
Virology
BioQuant 0090
Im Neuenheimer Feld 267
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-54 51231
Email: petr.chlanda@bioquant.uni-heidelberg.de
Web: http://www.bioquant.uni-heidelberg.de/research/junior-research-groups/chs-research-group-membrane-biology-of-viral-infection.html
Dr. Frauke Mücksch

Department of Infectious Diseases, Virology
Schaller Research Group
Im Neuenheimer Feld 344
University Hospital Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 35643
Email: Frauke.Muecksch@med.uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/zentrum/virologie/forschung/forschungsgruppen/muecksch

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, Heidelberg University

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

2008-2011: BSc (Biological Science), University of Frankfurt

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


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

Prof. Dr. Oliver T. Fackler

Department of Infectious Diseases
Integrative Virology
Im Neuenheimer Feld 344
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 1722
Email: oliver.fackler@med.uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/Fackler.6555.0.html?&L=1

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

1997-2000: Postdoctoral fellow, University of California at San Francisco

1994-1997: PhD 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


Dr. Marina Lusic

Department of Infectious Diseases Integrative Virology
Im Neuenheimer Feld 344
University Heidelberg
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-56 5007
Email: marina.lusic@med.uni-heidelberg.de
Web: https://ciid-heidelberg.de/research-groups/lusic-lab/

Scientific Vita

2014-present: Group Leader, Center of Infectious Diseases, Integrative Virology, Heidelberg University Hospital. Tenure Track Professor for Preclinical HIV-1 Research

2008-2013: Research scientist and project leader in Molecular Medicine Laboratory, ICGEB, Trieste; Extended faculty member, San Raffaele Scientific Institute, Milan

2004-2008: Post-doctoral scientist in Molecular Medicine lab, ICGEB, Trieste

1999-2003: PhD student (ICGB Fellowship) in Molecular Medicine Laboratory, International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy. PhD degree in Molecular Biology and Biochemistry, Faculty of Biological Sciences, University of Belgrade

Specific Research Interests

- Nuclear organization and chromatin landscape in viral infection
- Blood and brain immune cells as HIV-1 reservoirs (CD4 T cells and microglia)
- R-loops and mRNA splicing helicase complex in HIV-1 integration
- Metabolism and epigenetics in viral infection

Selected Publications


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 resistance. 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 flMSP1 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 flMSP1 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. Richard Thomson Luque
- Dr. Markus Ganter
- Dr. Julien Guizetti
- Dr. Richard Thomson Luque
- Dr. Victoria Ingham
- Dr. Franziska Hentzschel
Prof. Dr. Michael Lanzer

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 324
Heidelberg University Hospital
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-567844
Email: michael.lanzer@med.uni-heidelberg.de
Web: www.ukhd.de/parasitologie

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
1985-1988: Graduate Student, Center for Molecular Biology, Heidelberg University
1984-1985: Undergraduate Student, Hoffman LaRoche AG, Basel

Specific Research Interests

- Molecular Parasitology
- Drug resistance mechanisms of the malarial parasite
- Antigenic variation, cytoadherence, protein transport in Plasmodium falciparum
- Membrane transport processes

Selected Publications


Prof. Dr. Friedrich Frischknecht

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 324
Heidelberg University Hospital
D-69120 Heidelberg, Germany

Phone: +49-(0)6221-567537
Email: freddy.frischknecht@med.uni-heidelberg.de
Web: http://www.klinikum.uni-heidelberg.de/Malaria-3-Frischknecht.100117.0.html

Scientific Vita

2005-present: Group Leader, Center of Infectious Diseases, Parasitology, Heidelberg University Hospital
2002-2005: Postdoc, Institut Pasteur, Paris, France
2000: PhD, FU Berlin (summa cum laude)
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
- Live cell imaging
- Cell motility

Selected Publications


Spreng B, Fleckenstein H, Kübler P, Di Biagio C, Benz M, Patra P, Schwarz US, Cyrlaff M and Frischknecht F: Microtubule number and length determine cellular...
shape and function in Plasmodium. EMBO J. 2019; 38(15):e100984

Klug D, Frischknecht F: Motility precedes egress of malaria parasites from oocysts. *Elife* 2017; 6, e19157


Dr. Markus Ganter

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 344
Heidelberg University Hospital
D-69120 Heidelberg, Germany

Phone: +49 (0) 6221 56 6546
Email: markus.ganter@med.uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/parasitology-unit/research/ganter-lab or https://ciid-heidelberg.de/research-groups/ganter-lab/

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

2005-2009: PhD student, Department of Infectious Diseases, Parasitology, Heidelberg University Hospital, Heidelberg

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

Selected Publications


Dr. Julien Guizetti

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 344
Heidelberg University Hospital
D-69120 Heidelberg, Germany

Phone: +49 6221 56 7877
Email: julien.guizetti@med.uni-heidelberg.de
Web: www.guizetti-lab.com

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).
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


Mehnert AK, Simon CS and Guizetti J: Immunofluorescent staining protocol for STED nanoscopy of Plasmodium-infected red blood cells. Mol Biochem Parasitol. 2019; 239, 47-52


Dr. Victoria Ingham

Department of Infectious Diseases Parasitology, Heidelberg University Hospital Im Neuenheimer Feld 324, 69120 Heidelberg, Germany

Phone: +49 (0)6221 56-8284
Email: victoria.ingham@uni-heidelberg.de
Web: https://www.klinikum.uni-heidelberg.de/zentrum-fuer-parasitologie-unit/research/ingham-lab

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

Selected Publications


Ingham VA et al.: Integration of whole genome sequencing and transcriptomics reveals a complex picture of the reestablishment of insecticide resistance in the major malaria vector Anopheles coluzzii. PLoS Genetics 2021; 17(12):e0009370


Specific Research Interests

- Vector – parasite interactions in the context of insecticide use
- Molecular mechanisms of insecticide resistance
- Novel active ingredient discovery
- Integration of multiple -omics and molecular biology
Dr. Richard Thomson Luque

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 324
Heidelberg University Hospital
D-69115 Heidelberg, Germany
or
Sumaya Biotech GmbH & Co. KG
Vangerowstrasse 20, 69115 Heidelberg, Germany
Phone: +49 (0) 6221 56 764 38
Email: richard.thomson-luque@med.uni-heidelberg.de or thomson-luque@sumaya-biotech.com
Web: https://www.klinikum.uni-heidelberg.de/zentrum-fuer-infektiologie/parasitologielabor/research/sumaya-lab

Scientific Vita

2021-present: Senior 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, Madrid, Spain

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

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

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

2012-2013: Medical Research Fellow at Institut de Salut Global de Barcelona (CRESIB), Spain Barcelona

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

2007–2010 Emergency Lab Staff Hospital Universitari Germans Trias 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


Dr. Franziska Hentzschel

Department of Infectious Diseases
Parasitology
Im Neuenheimer Feld 344
Heidelberg University Hospital
D-69120 Heidelberg, Germany
Phone: +49 (0) 6221 56 654 6
Email: Franziska.Hentzschel@med.uni-heidelberg.de

Scientific Vita

2023-present: Junior group leader, Center of Infectious Diseases, Parasitology, Heidelberg University Hospital, Germany

2021-2023: Postdoc, Center of Infectious Diseases, Parasitology, Heidelberg University Hospital, Germany
2017-2021: Postdoc, Wellcome Center for Integrative Parasitology, University of Glasgow, UK
2013-2017: PhD, University of Heidelberg, Germany
2010-2012: Studies of Molecular Biosciences, Heidelberg University, Germany
2007-2010: Studies of Biochemistry, Technical University of Munich, Germany

Specific Research Interests

- Molecular parasitology
- Cell biology of the malaria parasite in the mosquito
- Unusual mitotic replication modes
- Development of novel genetic tools
- Quantitative imaging and single-cell transcriptomics

Selected Publications


Ripp J, Smyrnakou X, Neuhoff M-T, Hentzschel F, Frischknecht F: Phosphorylation of myosin A regulates gliding motility and is essential for Plasmodium transmission. *EMBO Rep* 2022; 23(7):e54857


MAJOR INFECTIOUS DISEASES | March 2024

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

Department of Infectious Diseases, Infectious Diseases Imaging Platform (IDIP) Im Neuenheimer Feld 344 Heidelberg University Hospital D-69120 Heidelberg, Germany

Phone: +49 (0) 6221 56 34410
Email: vibor.laketa@med.uni-heidelberg.de
Web: https://www.idip-heidelberg.org/

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

Specific Research Interests

- Advanced light and electron microscopy infrastructure to examine pathophysiological 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


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


List of the Associated Research Groups Major Infectious Diseases

Dr. Marco Binder
Research Group “Dynamics of early viral infection and the innate antiviral response”
F170, INF 242; 69120 Heidelberg
Phone: +49 6221 424974
Email: m.binder@dkfz.de
Web: https://tinyurl.com/ag-binder

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
- Interactions of tissue and immune cells

apl. Prof. Dr. Martin Müller
Research Group “Tumorvirus-specific vaccination strategies”
F035, INF 280, 69120 Heidelberg
Phone: +49 6221 424628
Email: martin.mueller@dkfz.de
Web: http://www.dkfz.de/en/f035/

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
Phone: +49 6221 9112 0
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
Prof. Dr. Adelheid Cerwenka

Angeborene Immunität
Centrum für Biomedizin und Medizintechnik Mannheim, Ludolf Krehl-Straße 13-17
68167 Mannheim
Phone: +49 621 383 71504
Email: adelheid.cerwenka@medma.uni-heidelberg.de
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

Prof. Dr. Felix Hoppe-Seyler

Research Group “Molecular Therapy of Virus-Associated Cancers”
Fo65, INF 242, 69120 Heidelberg
Phone: +49 6221 424872
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)
INF 280, 6. Stock, 69120 Heidelberg
Phone: +49 6221 42 1270
Email: h.wardemann@dkfz-heidelberg.de

Specific Research Interests

- Human immune responses against Plasmodium falciparum and SARS-CoV-2
- 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)
INF 280, H2.07.069, 69120 Heidelberg
Phone: +49 6221 421380
Email: e.stebbins@dkfz-heidelberg.de

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
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
PD Dr. Guido Wabnitz
Research Group „Granulocyte Immunology“
Institute of Immunology
Im Neuenheimer Feld 305, 69120 Heidelberg
Phone: +49 6221 56 35831
Email: guido.wabnitz@immu.uni-heidelberg.de
Web: http://www.wabnitz-lab.net

Specific Research Interests
• Neutrophil heterogeneity: Regulation of Neutrophil Populations
• Neutrophil function in inflammation and inflammatory diseases
• Inter-Leukocyte Communication

Prof. Dr. Stella E. Autenrieth
Research Group “Dendritic Cells in Infection and Cancer”
DKFZ, F171, INF 280, 69120 Heidelberg
Phone: +49 6221 421290
Email: stella.autenrieth@dkfz.de
Web: https://www.dkfz.de/en/virus-assoziierte-karzinogenese/groups/AGAutenrieth/index.html?m=16569390688

Specific Research Interests
• Immunobiology of dendritic cells (DCs)
• DC development in the context of infection and cancer
• Spectral flow cytometry and unsupervised data analysis
• Immunophenotyping in clinical trials
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

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 asymptotically during the dry season

Dr. Ross G. Douglas
Interdisziplinäres Forschungszentrum
Heinrich-Buff-Ring 26-32
35392 Giessen
Phone: +49 641 99 39145
Email: ross.g.douglas@ernaehrung.uni-giessen.de
Web: https://www.uni-giessen.de/fbz/fb09/institute/ernaehrungswissenschaft/prof/becker/forschross

Specific Research Interests
- Plasmodium cytoskeleton dynamics

Dr. Pierre-Yves Lozach
INRAE-University Lyon 1
50 Avenue Tony Garnier
69007 Lyon, France
Email: pierre-yves.lozach@univ-lyon1.fr
Web: www.lozachlab.com

Specific Research Interests
- amyloid fibril proteins
- arbovirus
- cell biology of virus entry
- early virus–host cell interactions
- emerging zoonotic viruses
- molecular factors responsible for viral virulence
- virus–receptor interactions

Prof. Dr. Jude Przyborski
Interdisziplinäres Forschungszentrum
Heinrich-Buff-Ring 26-32
35392 Giessen
Phone: +49 641 99 39124
Email: jude.przyborski@ernaehrung.uni-giessen.de
Web: https://www.uni-giessen.de/fbz/fb09/institute/ernaehrungswissenschaft/prof/becker

Specific Research Interests
- Malaria
- Chaperones
- Evolution
- Protein traffic
- Protein folding

Prof. Dr. Faith Osier
IAVI Human Immunology Laboratory
Chelsea & Westminster NHS Foundation Trust
369 Fulham Road, London SW10 9NH, UK
Phone: +44 (0) 7434 764077
Email: FOSier@iavi.org
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
University of Florida Medical School
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  
Department of Molecular Genetics & Microbiology  
University of Florida College of Medicine  
P.O. Box 100266  
Gainesville, FL 32610-0266  
Phone: 352-273-6380  
Email: s.boulant@ufl.edu  
Web: 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: +49 45131019030  
Email: sebastien.boutin@uni-luebeck.de  
Web: tba  
Specific Research Interests  
- Human microbiome  
- Airways infection  
- Host-microbes interactions  
- Microbial ecology and evolution  
- Next-generation sequencing

Prof. Dr. T. Dennis Nurjadi  
Klinik für Infektiologie und Mikrobiologie  
Universität zu Lübeck  
Phone: +49 45131019031  
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

Prof. Dr. Frederik Graw  
FAU Erlangen-Nürnberg / Universitätsklinikum Erlangen  
Department of Medicine 5 - Haematology and Oncology  
Modelling of Immune Processes  
Schwabachanlage 12  
91054 Erlangen, Germany  
Phone: +49 (0)9131 - 85 47601  
Email: frederik.graw@fau.de  
Web: https://www.medizin.uk-erlangen.de/forschung/lag-modellierung-von-immunprozessen-graw/  
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. Dr. Christine E. Engeland  
Research Group “Experimental Hematology and Immunotherapy”  
Johannisallee 32A, 04103 Leipzig  
Phone: +49 341 97-13023  
Email: christine.engeland@medizin.uni-leipzig.de  
Web: https://www.uni-wh.de/gesundheit/department-fuer-humanmedizin/lehrstuehle-institute-und-zentren/lehrstuhl-fuer-virologie-und-mikrobiologie/professor-fuer-experimentelle-virologie/ (status March 2024; new homepage of Leipzig University to follow)  
Specific Research Interests  
- Viral vectors for cancer immunotherapy and vaccination  
- Measles virus (vaccines) and paramyxoviruses  
- Virus-host interactions
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

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.
Students of the Major ‘Infectious Diseases’ WS 2023-2024

From left to right, in the back: Clemens Mathes, Hannah Simonis, Sanya Middha, Kolja Hildenbrand, Yllka Kabashi, Muriel Lauer, Lottida Phondeth, Richard Langi. In the front: Björn Schwortschik, Lena Tomaschko, Katharina Schaper, Veronika Dempf, Melissa Klein, Christopher Hub, Alejandro Vanazzi.