

# Research Groups of the Department of Infectious Diseases

## Infectious Diseases - A Brief Description

Studies of infectious diseases at the molecular and cellular level are a rather new research area, whose origin as an independent scientific discipline can be traced back to the discovery of microorganisms.

Even though infectious diseases have been known for thousands of years, exact knowledge of their source emerged only in the past century. Thus, the discovery of bacteria and viruses e.g. as cause for certain diseases began just in the middle of the 19th century.

Nowadays it is common knowledge that infectious diseases are caused by bacteria, viruses, fungi or parasites, and the rising threats from multiresistant bacteria or the emergence of new pathogens like influenza or SARS are frequently in the news. Apart from their enormous medical significance, however, microorganisms are 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 primarily in DNA viruses. Today, the science of infectious diseases is an interdisciplinary topic at the interface between medicine and molecular and cell biology.

With this fact in mind, the newly created Major “Infectious Diseases” within the MSc “Molecular Biosciences” offers the opportunity to study this topic in considerable depth, both in theory and in practice.

## 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 public health. There are six units, most of which are involved in the educational activities of this Major.

These units are:

- Medical Microbiology and Hygiene
- Parasitology
- Virology
- Molecular Virology
- Tropical Diseases and Public Health
- Integrative Virology

Most department heads are members of both the Faculty of Biosciences and the medical faculty and therefore are involved in teaching in both faculties. Previous lecture series and practicals in Biosciences, which were performed partially in collaboration with study groups at the Center for Molecular Biology Heidelberg (ZMBH) and the German Cancer Research Centre (DKFZ) were always well attended and dealt with molecular- and cell-biological aspects of medically important infectious diseases and their causative agents. Thus they covered an interdisciplinary field of high relevance.

Detailed information regarding the contents of the individual lectures (e.g. collection of slides) can be found on the websites of the corresponding departments.

The internet links are provided under “contact and addresses”.

## Research at the Department of Infectious Diseases

The main research topics of the departments include HIV/Aids, malaria, viral hepatitis and the interaction between bacteria and host cells (immunology of infection). All departments are well integrated into different local and international research consortia and networks, some of which are coordinated by departments of the institute.

One example is the Cluster of excellence “CellNetworks”. In addition there are close interactions and scientific cooperations with Numerous institutions of Heidelberg University, the European Laboratory for Molecular Biology (EMBL), the German Cancer Research Center (DKFZ) and the Max-Planck-Institute for Medical Research. In addition, we collaborate with numerous institutions in Europe and beyond.

To find out more about the scientific research activities of the Department of Infectious Diseases, the ZMBH-group and the associated research groups participating in this Major, please look at the profiles, which are in the appendix and the corresponding websites.

The Department of Infectious Diseases aims to further extend and Strengthen these research activities in particular by integrating Interdisciplinary approaches and most recent technologies. These include high-resolution light and electron microscopy with the three-dimensional reconstruction of complex cellular structures, high through-put method screening for proteome and transcription analyses as well as time-resolved analysis of pathogen / host-cell interactions by using live cell imaging, mathematic modelling and simulation.

# **Content and Structure of the Major 'Infectious Diseases'**

## **Content**

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. Modern infectious disease research focuses on molecular mechanisms of pathogenesis, so 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 a prerequisite. 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 Masters degree qualifies students to enter PhD programmes in Europe or could be a starting point for a career in the pharmaceutical industry or a biotech company.

Various doctoral study programmes 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 programme already after 3 semesters of Masters studies.

# Research Unit Profiles

## Medical Microbiology

### Fields of Interest

Teams in the Medical Microbiology and Hygiene department 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 department 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. Thus the department 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 department 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. Klaus Heeg (Head of the Medical Microbiology)
- Prof. Dr. Alexander Dalpke
- PD Dr. Katharina Kubatzky
- Dr. Konrad Bode

# Research Unit Profiles

## Medical Microbiology

Prof. Dr. Alexander Dalpke

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### Scientific Vita

- 2006-present: Professor (W3) for Medical Microbiology and Infection and Immunity,
- 2004: Habilitation, University lecturer for infection and immunity
- 1999-2004: Post-doc and Research Assistant, Inst. of Medical Microbiology, Philipps-University Marburg
- 1998-1999: First-year resident, Kreis- und Stadtkrankenhaus Alfeld, Internal Medicine, License to practice medicine
- 1998: Graduation (MD), Med. Microbiology, Center of Hygiene and Human Genetics, University Göttingen (summa cum laude)
- 1992-1998: Medical student, Georg-August University Göttingen

### Research Interest:

infection&Immunity; innate immunity, pattern recognition receptors, mucosal immunology; cytokine signaling

### Specific topics:

- Immunostimulation through bacterial nucleic acids
- Immune functions of airway epithelium
- Suppressor of Cytokine Signaling proteins (SOCS)



## Research Unit Profiles

### Medical Microbiology

PD Dr. rer. nat. Katharina Kubatzky

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#### Scientific Vita

- 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
- 2007- : Group Leader at the Department of Infectious Diseases, University of Heidelberg
- 2005-06: Junior Group Leader at the University of Freiburg, Institute of Experimental & Clinical Pharmacology & Toxicology
- 2002-04: Postdoctoral Fellow at the Ludwig Institute for Cancer Research, Brussels, Belgium
- 2001-2: Researcher at Alantos Pharmaceuticals, Heidelberg
- 1997-2000: PhD Thesis at the Max Planck Institute for Immunobiology, Freiburg
- 1992-97: Studies in Chemistry at the University of Freiburg

**Research interests:** signal transduction, bacterial protein toxins, cytokine receptor signaling, JAK-STAT pathway

**Specific topics:-** Mechanisms of immune evasion used by *Pasteurella multocida* Toxin; - Osteoclastogenesis: Crosstalk between the skeletal and the immune system; - RhoH as a modulator of immune cell functions

## Research Unit Profiles

### Medical Microbiology

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Dr. Konrad Bode

#### Scientific Vita

- 2011 „Facharzt für Mikrobiologie, Virologie und Infektionsepidemiologie“
- 2010 - Group Leader and resident physician, Dept. of Medical Microbiology and Hygiene, Heidelberg
- 2005 -2009 PostDoc and resident physician, Dept. of Medical Microbiology and Hygiene, Heidelberg
- 2004-2005: Junior houseofficer German Diabetes-Center
- 2003-2004: First-year resident, German Diabetes-Center and University Düsseldorf, Internal Medicine, License to practice medicine
- 1998-2003 : Graduation (MD), DKFZ, The German Cancer Research Center, Heidelberg, Department of Tumor-Biochemistry
- 1998-2003: Studies in Medicine, Ruprecht-Karls- University Heidelberg
- 1992–1997: Studies in Biochemistry (Diploma) at the University of Tübingen. Diploma thesis at the Department of Biochemistry Tübingen.

**Research interests:** innate immunity, pattern recognition receptors; mucosal immunology; cytokine signaling; microbiome

**Specific topics:**-immunoregulation of dendritic cells by protein acetylation; -Function of atypical I $\kappa$ B molecules I $\kappa$ Bu, I $\kappa$ BNS and Bcl3 in the TLR signaling

# Research Unit Profiles

## Parasitology

### Fields of Interest

Malaria has remained one of the most important infectious diseases worldwide, causing an estimated 250 Million clinical cases and killing 1 Million people *every* year. 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.

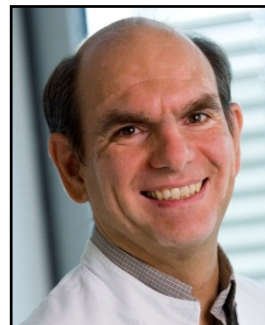
The following teams belong to the Parasitology Unit:

- Prof. Dr. Michael Lanzer (Head of the Parasitology Unit)
- PD Dr. Marcel Deponte
- Dr. Christian Epp
- Dr. Friedrich Frischknecht
- Dr. Ann-Kristin Mueller

# Research Unit Profiles

## Parasitology

Head of the research unit:  
Prof. Dr. Michael Lanzer



Prof. Dr. Michael Lanzer

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### Scientific Vita

1984-85 Undergraduate Student, Hoffman LaRoche AG, Basel

1985-88 Graduate Student, Center for Molecular Biology, Heidelberg University

1988-93 PostDoc, Sloan-Kettering Inst., New York

1994-98 Junior Group Leader, Research Center for Infectious Diseases, University of Würzburg

1996 Habilitation in Microbiology, University of Würzburg

1999 Full Professor & Department Chair of Parasitology, Heidelberg University

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

### Research Interests:

Molecular Parasitology, drug resistance mechanisms of the malarial parasite; antigenic variation, cytoadherence, protein trafficking in *P. falciparum*, membrane transport processes.

# Research Unit Profiles

## Parasitology

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### Scientific Vita

1997-2002 Diploma student, Biochemistry, E.K.-University Tübingen  
2003-2005 PhD student, Biochemistry, Interdisciplinary Research Center, J.L.-University Gießen  
2005-2006 Postdoc, J.L.-University Gießen & WEHI Melbourne  
2006-2010 Junior group leader, Institute of Physiological Chemistry, L.M.-University Munich  
Since 2010 Independent group leader, Dept. of Infectious Diseases, Parasitology, Heidelberg University Hospital  
2011 Habilitation in Biochemistry, Heidelberg University

### Research Interests:

Molecular parasitology & enzymology; mitochondrial protein import in parasitic protists (*Plasmodium* and *Leishmania*); redox catalysis and inhibitors; glutathione-dependent enzymes; comparative molecular evolution

# Research Unit Profiles

## Parasitology

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### Scientific Vita

- 1993-98 Undergraduate student of Biology, University of Heidelberg
- 1999-2003 Graduate student, Center for Molecular Biology (ZMBH), University of Heidelberg
- 2003-2007 PostDoc, Weill Medical College of Cornell University, New York, NY, USA
- 2007-2008 PostDoc, Fraunhofer Institute for Molecular Biology and Applied Ecology, Aachen
- since 2008 Project group leader, Dept. Infect. Diseases, Parasitology, Heidelberg University Hospital

### Research Interests:

Malaria vaccine development, humoral and cellular immune responses to malaria antigens, molecular mechanisms of red blood cell entry by malaria parasites, structure and function of merozoite surface proteins.

# Research Unit Profiles

## Parasitology

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### Scientific Vita

1990 – 1996	Studies of Biochemistry (FU Berlin)
1995 – 1996	Research student, Lab. of Molecular Biology, Cambridge, UK
1996 – 2000	PhD thesis, EMBL, Heidelberg
2000	PhD, FU Berlin (summa cum laude)
2001 – 2005	Postdoc, Institute Pasteur, Paris, France
2005 – present	Group Leader, Department of Infectious Diseases, Parasitology, Heidelberg University Hospital

### Research Interests:

Cell biology and biophysics of pathogen infection, malaria cell biology, live cell imaging, cell motility

# Research Unit Profiles

## Parasitology

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### Scientific Vita

1996-2000	Undergraduate Student, Philipps University Marburg
2000-01	Diploma thesis with Prof. E. Bremer, Philipps University Marburg (Microbiology)
2001-04	Graduate Student, Ruprecht-Karls University Heidelberg with Prof. K. Matuschewski (Parasitology)
2004-06	Postdoctoral Fellow with Prof. K. Matuschewski
2007-08	Junior Group Leader, Research Center for Infectious Diseases, University of Würzburg
2009	Independent Group Leader, Heidelberg University Hospital
2011	Founder, Shareholder and Mentor of MalVa GmbH
2012	Awarded the Minerva-Arches prizes

### Research Interests:

Molecular Parasitology, vaccinology, protective immunity, murine malaria, T-cell immunology, host-pathogen interactions



# Research Unit Profiles

## Molecular Virology

### Fields of Interest

Teams in the department Molecular Virology work on several highly important human pathogens, namely hepatitis B virus (HBV), hepatitis C virus (HCV) and Dengue virus (DENV). These viruses are leading causes for death worldwide with about 500 million people suffering from a chronic infection with either of the two hepatitis viruses and about 400 million new DENV infections occurring each year, especially in tropical countries.

As a department that focuses on molecular aspects of these infections, the following topics are studied: virus-host cell interaction, mechanism of host cell infection, live cell imaging and electron microscopy studies of infected cells, virus assembly and involved host cell factors, RNA replication, proteases and polymerases and their suitability for antiviral therapy, RNA structures and their role for viral replication, mathematical modeling and simulation of virus replication, virus-induced host cell alterations, innate immune response and viral counter measures, antiviral therapy and therapy resistance. 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.

The following teams belong to Molecular Virology:

- Prof. Dr. Ralf Bartenschlager (Head of the Molecular Virology)
- Prof. Dr. Stephan Urban
- PD Dr. Volker Lohmann:
- Dr. Marco Binder
- Dr. Alessia Ruggieri

# Research Unit Profiles

## Molecular Virology

Head of the research unit:

Prof. Dr. Ralf Bartenschlager

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### Scientific Vita

- 1981-87                   Studies in Biology, Heidelberg University
- 1990                     PhD in Molecular Biology , Heidelberg University
- 1991-93                 PostDoc, Central Research Unit, Hoffmann-La  
Roche AG, Basel, Switzerland
- 1994-98                 Assistent, University of Mainz
- 1999                     Habilitation, University of Mainz
- 2001                     Full Professor for Molecular Biology, University of  
Mainz
- since 2002             Full Professor and head of Molecular Virology,  
Department of Infectious Diseases, Heidelberg  
University, Germany; CHS Stiftungsprofessur  
"Molekulare Virologie"

### Research Interest:

Virus - host cell interaction (esp. HCV and Dengue virus), structural and functional aspects of viral RNA replication and assembly by using live cell imaging and electron microscopy techniques, viral and host targets for antiviral therapy, mathematical modeling of virus replication and spread as well as innate immune responses and viral countermeasures by using live cell imaging, viral persistence

# Research Unit Profiles

## Molecular Virology

Prof. Dr. Stephan Urban

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### Scientific Vita

- 1991 Diploma in Biochemistry, University of Tübingen
- 1991-95 PhD, Dept. Of Virology (Prof. Dr. P. H. Hofschneider), Max-Planck-Institut für Biochemie, Martinsried
- 1994-98 Assistant, University of Mainz
- 1995-2000 Postdoc Center for Molecular Biology (ZMBH), Heidelberg University (Prof. Dr. H. Schaller)
- 2000 Habilitation at the faculty of Biosciences, Heidelberg University
- 2000-2001 Stipendium at the ZMBH, Heidelberg University
- 2001-present Independent group leader at the Department of Infectious Diseases, Molecular Virology of Heidelberg University.

### Research Interest:

Molecular mechanisms of Hepatitis B- and Hepatitis D Virus/host interactions with a focus on the early and late events of viral infection; identification of hepadnaviral receptors and structural analyses of virus receptor interactions; Development of novel cell culture systems and animal models for HBV and HDV; Clinical development of entry inhibitors for HBV and HDV infection; Development of hepatotropic drugs for the therapy of liver diseases.

# Research Unit Profiles

## Molecular Virology

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### Scientific Vita

- 1987-1992            Biology School, University of Mainz
- 1982-1993            Diploma Thesis, University of Mainz
- 1993-1997            PhD, University of Mainz
- 1998-2002            PostDoc, Institute for Virology, University of Mainz
- 2002-present        Group Leader, Heidelberg University
- 2012                    Habilitation, Heidelberg University

### Research Interest:

Replication of hepatitis C virus, host cell factors of viral replication, role of the innate immune system in virus control

# Research Unit Profiles

## Molecular Virology

Dr. Marco Binder

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### Scientific Vita

1998 – 2003	Studies in Biology at University Konstanz
2001 – 2002	Graduate Coursework / Research (Diploma thesis) at State University of New York at Stony Brook
2003 – 2007	PhD thesis at Heidelberg University
2007 – 2008	Postdoc with Prof. Bartenschlager, Heidelberg
2009 – 2010	Postdoctoral Fellowship of the Medical Faculty Heidelberg
since 2011	Independent research group leader at the Department of Infectious Diseases, Heidelberg

### Research Interest

- early innate immune response against viral infection
- early events in viral replication
- systems biology of virus infection and host response

# Research Unit Profiles

## Molecular Virology

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### Scientific Vita

- 1995–1998                Studies in Cellular and Molecular Biology Metz and Lyon, France
- 1998–1999                Diploma thesis, University of Lyon, France
- 1999–2003                Ph.D. Virology, Ecole Normale Supérieure de Lyon, France
- 2004–2008                Postdoctoral at the Institute of Human Genetics, University of Saarland
- 2008–2013                Postdoctoral in the lab of Ralf Bartenschlager, Heidelberg University
- Since 09/ 2013            Group leader in the lab of Ralf Bartenschlager, Heidelberg University

### Research Interest

Molecular virology, dynamics of cellular stress and immune responses to RNA virus infection, quantitative live-cell imaging

# Research Unit Profiles

## Integrative Virology

### Fields of Interest

The central theme of my laboratory's research is to integrate aspects of virology, host cell biology and immunology to understand basic principles of HIV-1 pathogenesis. Our studies currently on three specific aspects. First, we study the molecular mechanisms of action of the HIV-1 pathogenicity factor Nef. This involves assessing how Nef manipulates central host cell processes such as vesicular transport, signal transduction and cell motility. Second, we investigate how HIV-1 is recognized by the innate immune system of the host and the virus evades this response. These studies focus on intrinsic immunity factors such as CD317/BST-2/thetherin and SAMHD1 as well as the virally encoded antagonists Vpu and Vpx. Finally, we study the underlying mechanism that confer HIV-1 target cells resistance to infection. These analyses focus on resting CD4+ T lymphocytes that are refractory to productive infection with HIV-1 with the aim to define the barriers to infection but also the potential immunological consequences productive infection of these abundant target cells would have.

Methodology most commonly used in the lab includes flow cytometry, live cell and confocal microscopy, as well as approaches to study protein-protein interactions, all preferentially in primary HIV-1 target cells.

# Research Unit Profiles

## Integrative Virology

Head of the Section:  
Prof. Dr. Oliver Fackler

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### Scientific Vita

Since 2013	Head of section Integrative Virology, Department of Infectious Diseases, Virology, Heidelberg University
Since 2007	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)
1993-1994	Diploma thesis in molecular virology (Homburg/Saar)
1989-1993	Studies in biology (Saarbrücken)

### Research Interest:

Immuno- and cell biology of HIV infection; innate and intrinsic immunity against HIV-1, HIV accessory genes



## Department of Infectious Diseases, Virology

### Research Topics

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 the entire viral life cycle, ranging from receptor binding to assembly and release.

A major focus of our research is human immunodeficiency virus (HIV), the causative agent of AIDS (**Kräusslich, Müller**). In spite of more than 25 years of 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?' 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. To address these topics, we combine traditional biochemical and virological approaches with advanced imaging techniques (live-cell imaging, novel labeling strategies, various super-resolution fluorescence microscopy, (cryo)electron microscopy and -tomography, correlative microscopy) 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 enteric viruses norovirus and reovirus, as well as bunyaviruses. Our main specific interests are (i) developing and exploiting vectors based on adeno-associated virus for basic research and gene therapy approaches (**Grimm**), (ii) the structural biology of the interaction of noroviruses (a major cause of infectious diarrhea) with cellular binding molecules (**Hansman**), (iii) understanding the entry and innate immune response induction by reoviruses in human polarized intestinal epithelial cells (**Boulant**) and (iv) entry pathways of bunyaviruses in the mammalian host and arthropod vector cells (**Lozach**). Again, a combination of conventional virological approaches with a wide variety of specialized techniques (e.g. high throughput approaches, advanced microscopy, x-ray crystallography etc.) is employed.

## Department of Infectious Diseases, Virology

### Research Profiles

#### **Prof. Dr. Hans-Georg Kräusslich**

Head of Virology

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### Scientific Vita

2004–present Director Department of Infectious Diseases, Heidelberg University  
2000–present Full professor and head of virology, Heidelberg University  
1995–1999 Full professor and head of department, Heinrich-Pette-Institute, Hamburg  
1996–1999 Director, Heinrich-Pette-Institute, 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)

### Research Interests

Molecular virology; cell biology of virus infection; assembly, release and molecular architecture of HIV particles; HIV Protease and antiviral resistance; HIV-cell interactions; Role of lipids in HIV replication; Transmission and therapy of HIV infection

## Department of Infectious Diseases, Virology

### Research Profiles

#### PD Dr. Barbara Müller

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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, Heinrich-Pette-Institute, 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  
1987-1991 PhD thesis (MPI for Med. Research Heidelberg, lab of R.S. Goody)  
1987 Diploma (Heidelberg University)  
1981-1986 Study of Biology (Technical University Darmstadt, Heidelberg University)

### Research Interests

Biology of human immunodeficiency virus. Focus of current work: fluorescently labeled HIV-1 derivatives; dynamics of HIV cell entry and HIV particle formation; HIV assembly and maturation; quantitative analysis of HIV replication steps.

## Department of Infectious Diseases, Virology

### Research Profiles

#### Dr. Steeve Boulant

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#### Scientific Vita

2012-present: Junior Group Leader CHS Foundation, University Hospital Heidelberg  
2008-2012: Post doctoral associate, Harvard Medical School Boston MA, USA  
2006-2008: Marie curie Post doctoral fellow, MRC Virology Unit Glasgow, UK  
2005-2006: Post doctoral associate, MRC Virology Unit Glasgow, UK  
2004-2005: Bridging grant fellow, IBCP-CNRS Lyon, France  
2001-2004: PhD in Molecular Biology and Biochemistry, IBCP-CNRS, France  
2000-2001: DEA in Molecular Biology and Biochemistry (Master), Lyon, France  
1998-2000: Bachelor degree in Molecular Biology and Biochemistry, Lyon, France

#### Research Interests

Virus entry, virus-host interactions, anti-viral innate immune response in intestinal polarized epithelium cells, viral commensal intestinal flora, molecular mechanisms triggering viral particle entry, characterization of the dynamic uptake and intracellular trafficking of viral pathogen using live-cell confocal microscopy, quantification of virus-receptor interaction using TIRF microscope and characterization of the impact of receptor clustering on virus entry, intracellular location and functional aspects of innate immunity sensor proteins (TLR and RLR) in polarized cells.

## Department of Infectious Diseases, Virology

### Research Profiles

#### Dr. Grant Hansman

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### Scientific Vita

2012 - present: Group Leader, Heidelberg University and DKFZ, Germany  
2005 - 2012: Senior Scientist, National Institute of Infectious Diseases, Japan  
2001 - 2005: PhD, The University of Tokyo, Japan  
1998 - 1999: Honors Degree, University of New South Wales, Australia  
1993 - 1996: BSc, Macquarie University, Australia

### Research Interests

Norovirus and other caliciviruses, structural biology of viral proteins (X-ray crystallography and cryo-EM), drug discovery using X-ray crystallography, antigenicity using virus-like particles, molecular epidemiology of noroviruses, zoonosis among caliciviruses, and human norovirus reverse genetics

## Department of Infectious Diseases, Virology

### Research Profiles

#### Dr. Dirk Grimm

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### Scientific Vita

2007-present Group leader "Virus-Host Interactions", Heidelberg University Hospital  
2006-2007 Research Associate, Stanford University, School of Medicine, CA, USA  
2001-2006 Postdoctoral Fellow, Stanford University, School of Medicine, CA, USA  
1999-2001 Postdoctoral Fellow, 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)

### Research Interests

Gene therapy with Adeno-associated viral (AAV) vectors; pathogen interactions with human host cells; RNA interference (RNAi) mechanisms and their role in viral and parasitic disease; *in vitro* & *in vivo* annotation of infection-related genes & miRNAs; development of new AAV/RNAi-based clinical modalities to treat and prevent human infections; characterization of circulating miRNAs as novel diagnostic or prognostic biomarkers for infection; use of AAV, RNAi and genome editing technologies to create and modify human induced pluripotent stem cells.

## Department of Infectious Diseases, Virology

### Research Profiles

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### Scientific Vita

2013-present: Junior Group Leader, University Hospital Heidelberg, Virology  
2012-2013: Assistant Professor, Institut Pasteur International Network, Laval, Canada  
2010-2012: Senior Research Associate, ETH Zurich, Switzerland  
2008-2010: Marie Curie Post-doctoral fellow, ETH Zurich, Switzerland  
2007-2008: Post-doctoral associate, ETH Zurich, Switzerland  
2005-2007: PDVI Post-doctoral fellow, Institut Pasteur Paris, France  
2001-2004: PhD in Fundamental Virology, Institut Pasteur Paris, France  
2000-2001: MSc in Fundamental Virology, Institut Pasteur Paris, France

### Research Interests

Cell biology of arbovirus infections; viral diseases transmitted by insects and ticks; early arbovirus-host cell interactions; arbovirus transmission and entry. Works in progress: biophysical properties and architecture of tick cell-derived bunyavirus particles; cell biology of the tick vector; reverse genetics system for bunyaviruses; bunyavirus intracellular trafficking and penetration.

## Department Profiles

### CTR. f. Molecular Biology HD (ZMBH)

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### Scientific Vita

- 1972-1975 Bachelor of Biochemistry, University of Cambridge, UK
- 1975-1978 PhD student, National institute for Medical research, Mill Hill, London, UK
- 1979 PhD (Zoology) University of London, UK
- 1978-1981 Post-doctoral Fellow, Imperial College, London, UK
- 1981-1983 Post-doctoral Fellow, Stanford University Medical Center, California, USA
- 1983-1990 Assistant Professor, The Rockefeller University, New York USA
- 1990-1990 Associate Professor, The Rockefeller University, New York USA
- 1990- now Professor for Microbiology, University of Heidelberg

### Research Interest:

- Gene regulation of trypanosome
- Development of modern diagnostics for trypanosome infection