



**3-4**  
**SEPTEMBER**  
*2026*



PROGRAMME

# TWINCORE & CIIM SYMPOSIUM 2026

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PATHWAYS TO INFECTION RESILIENCE

## DAY 1 | 3 SEPTEMBER 2026

### VIRUS EVOLUTION

- 09:00 - 09:30 **Ulrich Kalinke & Thomas Pietschmann** | Welcome address
- 09:30 - 09:50 **Julia Rebecca Port (Helmholtz Centre for Infection Research)**  
From genital mucosa to respiratory tract: Zoonotic mpox virus clades amplify transmission and pathogenesis in animal models
- 09:50 - 10:10 **Max Kellner (Helmholtz Centre for Infection Research)**  
Infected but not sick: Decoding naturally evolved resilience to viral disease in reservoir hosts
- 10:10 - 10:30 **Chris Lauber (TWINCORE)**  
Prioritizing RNA viruses by quantifying spillover risk across families using a data-driven framework grounded in virus-host coevolution

### Coffee Break

### CLINICAL INFECTION RESEARCH I

- 11:00 - 11:20 **Stephan Traidl (Hannover Medical School)**  
Eczema herpeticum - severe herpes infection in atopic dermatitis
- 11:20 - 11:40 **Theresa Graalmann (TWINCORE)**  
Precision immunomodulation upon severe acute respiratory infection
- 11:40 - 12:00 **Christian Schultze-Florey (Hannover Medical School)**  
CAR-T cell therapy induced immune cell repertoire changes increase the susceptibility to infectious complications

### Lunch Break

### CLINICAL INFECTION RESEARCH II

- 13:00 - 13:20 **Christian Sieben (Helmholtz Centre for Infection Research)**  
The virus-cell interface: Linking receptor organization to actin remodelling
- 13:20 - 13:40 **Helenie Kefalakes (Hannover Medical School (MHH))**  
Bulevirtide treatment reduces bystander activation of CD8+ T cells in chronic hepatitis D virus infection

- 13:40 - 14:00 **Patrick Behrendt (TWINCORE)**  
From antibody discovery to infection resilience: New diagnostic and therapeutic strategies against Hepatitis E virus
- 14:00 - 14:20 **Sampurna Chakrabarti (Helmholtz Centre for Infection Research)**  
Functional neurovirology of peripheral sensory neurons

### Coffee Break

## THERAPEUTIC STRATEGIES

- 15:00 - 15:20 **Christiane Iserman (Helmholtz Centre for Infection Research)**  
From condensate biology to antiviral strategies
- 15:20 - 15:40 **Maren Schubert (Helmholtz Centre for Infection Research)**  
Virus-like-particles based technologies to fight infectious diseases
- 15:40 - 16:00 **Yannic Bartsch (TWINCORE)**  
Harnessing non-neutralizing antibodies to enhance infection resilience
- 16:00 - 16:20 **Lina Herhaus (Helmholtz Centre for Infection Research)**  
Molecular gatekeepers of immune recognition:  
Targeting autophagy-controlled immune evasion

### Coffee Break

## 16:30 - 17:00 Panel Discussion

**Milan Gerovac<sup>#</sup>, Gesine Hansen<sup>\*</sup>, Florian Heidel<sup>\*</sup>,  
Florian Perner<sup>\*</sup>, Maren Schubert<sup>#</sup>, Thomas Werfel<sup>\*</sup>**  
Clinical collaborations: Finding the right partners

<sup>\*</sup> Hannover Medical School

<sup>#</sup> Helmholtz Centre for Infection Research

### Barbecue

## DAY 2 | 4 SEPTEMBER 2026

### PHAGES

- 09:00 Ulrich Kalinke | Welcome address
- 09:00 - 09:30 **Christian Kühn (Hannover Medical School)**  
Key Note Lecture: Advancing personalized phage therapy in Hannover: Clinical experience and translational progress
- 09:30 - 09:50 **Iana Fedorova (Helmholtz Centre for Infection Research)**  
Small but mighty: how non-essential genes help phages overcome bacterial defenses
- 09:50 - 10:10 **Milan Gerovac (Helmholtz Centre for Infection Research)**  
Nucleus-forming phage virulence and host takeover
- 10:10 - 10:30 **Jakob Wirbel (Helmholtz Centre for Infection Research)**  
Investigating gut microbiome dynamics in allo-HCT and beyond

### Coffee Break

### INFECTION RESILIENCE

- 11:00 - 11:20 **Leonard Knegendorf (TWINCORE)**  
From bacterial genomes to infection risk:  
Data-driven approaches to hospital-associated infections
- 11:20 - 11:40 **Natalia Torow (Helmholtz Centre for Infection Research)**  
Tolerance as resilience: How the neonatal liver balances infection control and tissue protection
- 11:40 - 12:00 **Martin Jahn (Helmholtz Centre for Infection Research)**  
Ecology as a determinant of infection resistance: from nutrients to space

### End/Lunch Snack

# Prof. Dr. Yannic Bartsch

Antiviral Antibody-Omics, TWINCORE Centre for Experimental and Clinical Infection Research



## Harnessing non-neutralizing antibodies to enhance infection resilience

### Abstract

My research focuses on antiviral antibodies, with a particular emphasis on Fc effector functions and their capacity to engage the innate immune system. In our group, we strive to gain a more systemic understanding of the mechanisms underlying antibody-mediated protection and of how antiviral immunity is coordinated across distinct Fc effector pathways. We also seek to harness Fc-mediated activity to enhance therapeutic efficacy and to develop antibody-based strategies that are less susceptible to immune evasion and remain effective against viral escape variants.

### Highlight publications

**Bartsch YC**, Webb NE, Burgess E, Kang J, Lauffenburger DA and Julg BD (2025) Combinatorial Fc modifications for complementary antibody functionality. *MAbs* 17(1): 2465391

**Bartsch YC**, Cizmeci D, Kang J, Gao H, Shi W, Chandrashekar A (2023) Selective SARS-CoV2 BA.2 escape of antibody Fc/Fc-receptor interactions. *iScience* 26(5):106582

# PD Dr. med. Patrick Behrendt

Translational Virology, TWINCORE Centre for Experimental and Clinical Infection Research



**From antibody discovery to infection resilience: New diagnostic and therapeutic strategies against Hepatitis E virus**

## Abstract

PD Dr. med. Patrick Behrendt leads the Junior Research Group “Translational Virology” at TWINCORE. His research focuses on the hepatitis E virus (HEV), a globally important cause of acute viral hepatitis. Key areas of interest include virus–host interactions, factors influencing disease outcome, and the development of novel antiviral and preventive strategies. Using advanced cell culture models and clinical samples, his group investigates biomarkers for improved diagnostics and therapy and explores the relevance of HEV infections beyond the liver.

## Highlight publications

Ssebyatika G, Dinkelborg K, Stroh LJ, Hinte F, Corneillie L, Hueffner L, Guzman EM, Nankya PL, Pluckebaum N, Fehlau L, Garn J, Meyer N, Prallet S, Mehnert AK, Kraft ARM, Verhoye L, Jacobsen C, Steinmann E, Wedemeyer H, Viejo-Borbolla A, Dao Thi VL, Pietschmann T, Lutgehetmann M, Meuleman P, Dandri M, Krey T and **Behrendt P** (2025) Broadly neutralizing antibodies isolated from HEV convalescents confer protective effects in human liver-chimeric mice. *Nat Commun* 16(1): 1995

Wahid A, Meyer N, Wundes C, Huffner L, Janshoff S, Frericks N, Friesland M, Dinkelborg K, Aliabadi E, Laue F, Cornberg M, Maasoumy B, Bremer B, Pischke S, Muller T, Wiesch JZS, Benckert J, Ulrich RG, Hardtke S, Dorge P, Vondran F, Lohse A, Manns MP, Todt D, Wedemeyer H, Pietschmann T, Steinmann E, Gomer A and **Behrendt P** (2025) Extrahepatic Replication and Genomic Signatures of the Hepatitis E Virus in the Kidney. *Liver Int* 45(7): e70183

# Dr. Sampurna Chakrabarti

Mechanisms of Infection and Nociception, Helmholtz Centre for Infection Research



## Functional neurovirology of peripheral sensory neurons

### Abstract

Herpes simplex virus type 1 (HSV-1) establishes lifelong latency in peripheral sensory neurons following infection of the skin. Sensory neurons comprise molecularly and functionally distinct subtypes that differ in their permissiveness to HSV-1 infection. We investigate how HSV-1 infection alters neuronal excitability and mechanosensitivity at the level of individual sensory neuron subtypes using single-cell patch-clamp electrophysiology, glycan profiling, and single-neuron proteomics. Because neuronal hyperexcitability underlies nociception, our work aims to define the mechanisms linking viral infection to pain.

### Highlight publications

**Chakrabarti S**, Makhmut A, Mohammadi A, Luo W, Wang L, Lewin GR, Coscia F (2026) Deep visual proteomics uncovers nociceptor diversity and pain targets. Nat Commun 17(1):34372

**Chakrabarti S**, Klich JD, Khallaf MA, Hulme AJ, Sánchez-Carranza O, Baran ZM, Rossi A, Huang AT, Pohl T, Fleischer R, Fürst C, Hammes A, Bégay V, Hörnberg H, Finol-Urdaneta RK, Poole K, Dottori M, Lewin GR (2024) Touch sensation requires the mechanically gated ion channel ELKIN1. Science 383(6686):992-998

# Dr. Iana Fedorova

Antiviral Immunity of Bacteria, Helmholtz Centre for Infection Research



## Small but mighty: How non-essential genes help phages overcome bacterial defences

### Abstract

Bacteriophages are natural, rapidly evolving killers of bacteria that have shown strong potential as antimicrobial agents. To resist phage invasion, bacteria evolve sophisticated defence systems, many strikingly related to eukaryotic innate immunity. My work focuses on bacterial antiviral immunity and elegant strategies that phages use to overcome it. In this talk, I will show how phages use non-essential, small genes to evade signalling-based cGAS and TIR-related bacterial defences. Equipping phages with anti-immune genes can make phages more effective against clinical, defence-rich strains.

### Highlight publications

**Fedorova I**, Yue Y, Gao Z, Grunberg M, Wang H, Li J, Zang Z, De Nault D, Yang X, Gerdt JP, Feng Y, Bondy-Denomy J (2026) Balancing of immune activation and suppression during phage infection. *bioRxiv* (Preprint) 2026.06.04.730250

Li D\*, Xiao Y\*, **Fedorova I\***, Xiong W\*, Wang Y\*, Liu X\*, Huiting E, Ren J, Gao Z, Zhao X, Cao X, Zhang Y, Bondy-Denomy J, Feng Y (2024) Single phage proteins sequester signals from TIR and cGAS-like enzymes. *Nature* 635(8039):719-727.

\*Contributed equally

# Dr. Milan Gerovac

Complexes in Phage-infected Cells, Helmholtz Centre for Infection Research



## Nucleus-forming phage virulence and host takeover

### Abstract

Phages can carry exceptionally large genomes, exceeding 200 kb and encoding hundreds of proteins involved in host takeover and viral reproduction. In particular, nucleus-forming phages assemble eukaryotic-like intracellular structures, including a phage nucleus. Yet, the evolutionary advantage of such a complex replication cycle has long remained unclear. Recent findings suggest that these phages can reprogram the host stress response and switch into alternative replication modes, challenging our current understanding of virulent phages. We aim to harness this newly emerging biology of phage-driven host takeover to advance personalized phage therapy.

### Highlight publications

Dougherty PE, Bernard C, Carstens AB, Bumunang E, **Gerovac M**, Müsken M, Stanford K, McAllister TA, Rocha EPC, Hansen LH (2026) Persistent virulent phages exist across bacterial isolates. *Nat Microbiol* 11(1):31-41

**Gerovac M**, Buhlmann L, Zhu Y, Đurica-Mitić S, Rech V, Carien S, Gräfenhan T, Popella L, Vogel J (2025) Programmable antisense oligomers for phage functional genomics. *Nature* 646(8087):1195-1203

# Dr. Dr. Theresa Graalmann

Translational Immunology, TWINCORE Centre for Experimental and Clinical Infection Research



## Precision immunomodulation upon severe acute respiratory infection

### Abstract

Theresa Graalmann is a clinician scientist in the Department of Rheumatology and Immunology at MHH and PI of the junior research group Translational Immunology at TWINCORE. As a trained MD/PhD she bridges clinical treatment of patients with systemic inflammatory diseases to clinical need-oriented translational science. Her groups' research focusses on dissecting tissue-specific inflammation in inflammatory rheumatic diseases affecting lung and skin and how such diseases affect infection susceptibility in patients. The overall aim of her projects is to precise immunomodulatory therapies in vulnerable patients for optimized treatment and prevention of infection complications.

### Highlight publications

Ehlers C, Biermann H, Thiele T, Schupp JC, Villa M, Jänke C, Risser LM, Witte T, Kalinke U, Seeliger B\*, **Graalmann T\*** (2025) T cells of patients with systemic sclerosis or Sjögren's disease display an aberrant metabolic state and memory phenotype in blood and lungs. *Rheumatology (Oxford)* 64(8):4806-4815

Ehlers C, Thiele T, Biermann H, Traidl S, Bruns L, Ziegler A, Schefzyk M, Bartsch LM, Kalinke U, Witte T, **Graalmann T** (2025) Toll-Like Receptor 8 is Expressed in Monocytes in Contrast to Plasmacytoid Dendritic Cells and Mediates Aberrant Interleukin-10 Responses in Patients With Systemic Sclerosis. *Arthritis Rheumatol* 77(1):59-66

# Prof. Dr. Lina Herhaus

Immune Signalling, Helmholtz Centre for Infection Research



## Molecular gatekeepers of immune recognition: Targeting autophagy-controlled immune evasion

### Abstract

My research investigates how pathogens exploit cellular quality-control, autophagy and organelle communication pathways to establish infection and evade host immunity. We study how bacterial and viral pathogens remodel membrane contact sites, intracellular trafficking and extracellular vesicle release to access nutrients, promote replication and alter immune signalling. By defining these host–pathogen interactions, my laboratory aims to identify new therapeutic targets that strengthen antimicrobial defence and limit infection.

### Highlight publications

**Herhaus L**, Gestal-Mato U, Eapen VV, Mačinković I, Bailey HJ, Prieto-Garcia C, Misra M, Jacomin AC, Ammanath AV, Bagarić I, Michaelis J, Vollrath J, Bhaskara RM, Bündgen G, Covarrubias-Pinto A, Husnjak K, Zöller J, Gikandi A, Ribičić S, Bopp T, van der Heden van Noort GJ, Langer JD, Weigert A, Harper JW, Mancias JD, Dikic I (2024) IRGQ-mediated autophagy in MHC class I quality control promotes tumor immune evasion. *Cell* 187(25):7285-7302

Gestal-Mato U, Lascaux P, Poveda-Cuevas SA, Cristiani A, Camp B, Aghapour M, Ammanath AV, Bhaskara RM, Dikic I, **Herhaus L** (2026) TBK1 restricts IRGQ-mediated autophagy. *Nat Commun* 17(1):4335

# Dr. Christiane Iserman

Biomolecular Condensates in Infection, Helmholtz Centre for Infection Research



**From condensate biology to antiviral strategies**

## Abstract

Our lab investigates how biomolecular condensates shape pathogen-host interactions and how these dynamic assemblies can be exploited for antiviral development. We study how viral and host condensates form and function in replication, viral assembly, and innate immunity, using advanced imaging, biochemical approaches, and organoid models. By linking fundamental virology with drug discovery, we aim to uncover condensate-based mechanisms and identify innovative targets for antiviral intervention.

## Highlight publications

**Iserman C**, Desroches Altamirano C, Jegers C, Friedrich U, Zarin T, Fritsch AW, Mittasch M, Domingues A, Hersemann L, Jahnel M, Richter D, Guenther UP, Hentze MW, Moses AM, Hyman AA, Kramer G, Kreysing M, Franzmann TM, Alberti S (2020) Condensation of Ded1p Promotes a Translational Switch from Housekeeping to Stress Protein Production. *Cell* 181(4):818-831

**Iserman C**, Roden CA, Boerneke MA, Sealfon RSG, McLaughlin GA, Jungreis I, Fritch EJ, Hou YJ, Ekena J, Weidmann CA, Theesfeld CL, Kellis M, Troyanskaya OG, Baric RS, Sheahan TP, Weeks KM, Gladfelter AS (2020) Genomic RNA Elements Drive Phase Separation of the SARS-CoV-2 Nucleocapsid. *Mol Cell* 80(6):1078-1091

# Prof. Dr. Martin Jahn

Bacterial Infection Ecology, Helmholtz Centre for Infection Research



## Ecology as a determinant of infection resistance: from nutrients to space

### Abstract

Microbial communities colonise many parts of our bodies, critically impacting our health such as by protecting against pathogens. But how the diverse microbes arrange and organise themselves to generate health effects is largely unknown. To tackle this challenge, we are developing methods to map the structure of the microbiome and resolve how this structure affects health benefits. In addition, we study how microbiota influence and manipulate us, aiming for real translational and clinical potential.

### Highlight publications

Bakkeren E, Piskovsky V, Lee MNY, **Jahn MT** and Foster KR (2025) Strain displacement in microbiomes via ecological competition. *Nat Microbiol* 10(12): 3122-3135

Spragge F, Bakkeren E, **Jahn MT**, E BNA, Pearson CF, Wang X, Pankhurst L, Cunrath O and Foster KR (2023) Microbiome diversity protects against pathogens by nutrient blocking. *Science* 382(6676): eadj3502

# Dr. med. Helenie Kefalakes

Clinical Department of Gastroenterology, Hepatology, Infectiology and Endocrinology, Hannover Medical School



## Bulevirtide treatment reduces bystander activation of CD8+ T cells in chronic hepatitis D virus infection

### Abstract

Dr. Helenie Kefalakes performs basic and translational research to better understand immune failure in chronic infection, with a special focus on adaptive immunity in viral hepatitis and liver immunopathology. To do so, she works at the interface of hepatology, immunology, virology and bioinformatics, by extracting clinically relevant questions and using cutting-edge technology. Her long-term goal is to exploit adaptive immunity to achieve superior antiviral function, as this will allow to tailor available treatment options and develop personalized immunotherapeutic strategies.

### Highlight publications

Albarghash R, Jacobsen C and **Kefalakes H** (2026) Exploiting the immunopathogenesis of hepatitis D virus infection to develop superior treatment options. *Antiviral Res* 250: 106416

**Kefalakes H**, Horgan XJ, Jung MK, Amanakis G, Kapuria D, Bolte FJ, Kleiner DE, Koh C, Heller T and Rehmann B (2021) Liver-Resident Bystander CD8(+) T Cells Contribute to Liver Disease Pathogenesis in Chronic Hepatitis D Virus Infection. *Gastroenterology* 161(5): 1567-1583 e9

# Prof. Dr. Max Josef Kellner

Virus-Host Co-Evolution, Helmholtz Centre for Infection Research



**Infected but not sick: Decoding naturally evolved resilience to viral disease in reservoir hosts**

## Abstract

The Laboratory for Virus-Host Co-evolution investigates the antiviral immune systems of diverse mammalian species, with a particular focus on natural reservoir hosts that display remarkable resilience to viral disease. Using functional genetics and organoid models, we study how these animals achieve effective viral control while limiting inflammation. By uncovering the genetic basis of viral disease resilience, we aim to harness naturally evolved defence mechanisms to develop new strategies for preventing and treating emerging viral infections.

## Highlight publications

**Kellner MJ**, Monteil VM, Zelger P, Pei G, Jiao J, Onji M, Nayak K, Zilbauer M, Balkema-Buschmann A, Dorhoi A, Mirazimi A, Penninger JM (2025) Bat organoids reveal antiviral responses at epithelial surfaces. *Nat Immunol* 26(6):934-946

# Dr. med. Leonard Knegeendorf

Data-driven Clinical Microbiology, TWINCORE Centre for Experimental and Clinical Infection Research



**From bacterial genomes to infection risk: Data-driven approaches to hospital-associated infections**

## Abstract

The junior research group “Data-driven Clinical Microbiology” uses an unbiased, data-driven approach to identify risk factors for hospital-associated infections. We integrate bacterial genomic data, including virulence and antimicrobial resistance genes, with clinical and epidemiological information. Our work focuses on enterococci, Klebsiella and other clinically relevant pathogens in vulnerable patient populations. Our goal is to establish a framework for more targeted and individualized infection prevention by identifying patient-specific risks, transmission pathways and the pathogenic potential of bacterial isolates.

## Highlight publications

**Knegeendorf L**, Sommer A, Baier C, Weber RE, Fischer MA, Werner G, Ziesing S, Schlüter D (2026) Genomic epidemiology of Enterococcus faecium bloodstream infections during a VanB-type VRE peak reveals an oligoclonal scenario: an observational study at a German university hospital (2017-2022). J Clin Microbiol 64(4): e0104425

Böhne C, Baier C, Erdmann J, Ebadi E, Zirkler C, Lindenberg M, Schlüter D, Pirr S, Peter C, Bohnhorst B, **Knegeendorf L** (2026) Prospective genomic and epidemiologic surveillance of Klebsiella pneumoniae in a tertiary NICU. Antimicrob Resist Infect Control 15(1):64

# Prof. Dr. med. Christian Kühn

Clinical Department of Cardiothoracic, Transplantation and Vascular Surgery,  
Hannover Medical School



**Advancing personalized phage therapy in Hannover: Clinical experience and translational progress**

## Abstract

Prof. Dr. med. Christian Kühn is a cardiothoracic surgeon and expert in bacteriophage therapy. He serves as Senior Consultant at the Department of Cardiothoracic, Transplantation, and Vascular Surgery at Hannover Medical School (MHH) in Germany. He is also Medical Director and Co-Founder of Delta G Avaris GmbH, a company focused on manufacturing phage active ingredients for personalized phage therapy. His research focuses on phage therapy as an alternative treatment for multidrug-resistant bacterial infections, particularly in cardiothoracic surgery. He has authored several scientific publications on the topic and co-wrote the book “Bakteriophagen: Wenn Antibiotika nicht mehr helfen” with Dr. Thomas Häusler, highlighting the potential of phage therapy. His work is instrumental in advancing personalized bacteriophage treatments in Germany, contributing to efforts against antimicrobial resistance.

## Highlight publications

Willy C, Bugert JJ, Classen AY, Deng L, Duchting A, Gross J, Hammerl JA, Korf IHE, **Kühn C**, Lieberknecht-Jouy S, Rohde C, Rupp M, Vehreschild M, Vogegele K, Wienecke S, Witzernath M, Wurster S, Ziehr H, Moelling K and Broecker F (2023) Phage Therapy in Germany-Update 2023. *Viruses* 15(2): 588

Rubalskii E, Ruemke S, Salmoukas C, Boyle EC, Warnecke G, Tudorache I, Shrestha M, Schmitt JD, Martens A, Rojas SV, Ziesing S, Bochkareva S, **Kuehn C** and Haverich A (2020) Bacteriophage Therapy for Critical Infections Related to Cardiothoracic Surgery. *Antibiotics* (Basel) 9(5): 232

# Prof. Dr. Chris Lauber

Computational Virology, TWINCORE Centre for Experimental and Clinical Infection Research



**Prioritizing RNA viruses by quantifying spillover risk across families using a data-driven framework grounded in virus-host coevolution**

## Abstract

Viruses are everywhere—yet many remain undiscovered. The research group Computational Virology uses high-throughput computational methods to explore this hidden world. By analyzing large-scale genetic data, we identify new viruses, reconstruct their genomes and study their evolution and diversity in humans and across eukaryotes. We develop robust frameworks for taxonomic classification of newly identified viruses and investigate the evolutionary trajectories and host range of RNA viruses to assess their potential to cross species barriers and pose risks to human health.

## Highlight publications

Neuman BW, Smart A, Gilmer O, Smyth RP, Vaas J, Boker N, Samborskiy DV, Bartenschlager R, Seitz S, Gorbalenya AE, Caliskan N and **Lauber C** (2025) Giant RNA genomes: Roles of host, translation elongation, genome architecture, and proteome in nidoviruses. *Proc Natl Acad Sci U S A* 122(7): e2413675122

**Lauber C**, Zhang X, Vaas J, Klingler F, Mutz P, Dubin A, Pietschmann T, Roth O, Neuman BW, Gorbalenya AE, Bartenschlager R, Seitz S (2024) Deep mining of the Sequence Read Archive reveals major genetic innovations in coronaviruses and other nidoviruses of aquatic vertebrates. *PLoS Pathog* 20(4): e1012163

# Prof. Dr. Julia Rebecca Port

Transmission Immunology, Helmholtz Centre for Infection Research



**From genital mucosa to respiratory tract: Zoonotic mpox virus clades amplify transmission and pathogenesis in animal models**

## Abstract

Julia Rebecca Port has been leading the 'Transmission Immunology' early-career research group at the Helmholtz Centre for Infection Research (HZI) in Braunschweig since 2024. Her research lies at the interface of immunology, virology and global health. Her work focuses on how mucosal immune responses and aerobiological factors influence the transmission of respiratory viruses - including SARS-CoV-2, influenza viruses and Mpox. In future, she aims to identify immune signatures that predict the risk of transmission in order to develop targeted containment strategies.

## Highlight publications

**Port JR**, Riopelle JC, Smith SG, Myers L, Kaiser FK, Lewis MC, Gallogly S, Okumura A, Bushmaker T, Schulz JE, Rosenke R, Prado-Smith J, Carmody A, Bane S, Smith BJ, Saturday G, Feldmann H, Rosenke K, Munster VJ (2024) Infection with mpox virus via the genital mucosae increases shedding and transmission in the multimammate rat (*Mastomys natalensis*). *Nat Microbiol* 9(5):1231-1243

**Port JR**, Yinda CK, Riopelle JC, Weishampel ZA, Saturday TA, Avanzato VA, Schulz JE, Holbrook MG, Barbian K, Perry-Gottschalk R, Haddock E, Martens C, Shaia CI, Lambe T, Gilbert SC, van Doremalen N, Munster VJ (2023) Infection- or AZD1222 vaccine-mediated immunity reduces SARS-CoV-2 transmission but increases Omicron competitiveness in hamsters. *Nat Commun* 14(1):6592

# Dr. Maren Schubert

Virus-like-particle based technologies, Helmholtz Centre for Infection Research



## Virus-like-particles based technologies to fight infectious diseases

### Abstract

Our technology-oriented research is based on recombinant virus-like-particles (VLPs), which are produced by co-expression of the structural proteins of the respective virus. The resulting VLPs mimic the shells of real viruses very authentically, but do not contain viral genetic information, which enables research in BSL1 laboratories. Such authentic VLPs can be used directly as vaccines or as a diagnostic tool to evaluate immune responses. Modifications inside the VLP, like the introduction of a marker protein, enable investigations of the entry mechanisms. These VLPs are used for drug development, as e.g., entry inhibition by antibodies can be measured in high-throughput cell assays.

### Highlight publications

Jaron M, Lehky M, Zarà M, Zaydowicz CN, Lak A, Ballmann R, Heine PA, Wenzel EV, Schneider KT, Bertoglio F, Kempter S, Köster RW, Barbieri SS, Van den Heuvel J, Hust M, Dübel S, **Schubert M** (2022) Baculovirus-free SARS-CoV-2 Virus Like Particle Production in Insect Cells for Rapid Neutralization Assessment. *Viruses* 14: 2087

Lampinen V, Gröhn S, Lehmler N, Jartti M, Hytönen VP, **Schubert M\***, Hankaniemi MM\* (2024) Production of norovirus-, rotavirus-, and enterovirus-like particles in insect cells is simplified by plasmid-based expression. *Sci Rep* 14:14874 (\*senior authors)

# PD Dr. med. Christian Schultze-Florey

Clinic for Haematology, Hemostaseology, Oncology and Cell Therapy, Hannover Medical School



»» **CAR-T cell therapy induced immune cell repertoire changes increase the susceptibility to infectious complications**

## Abstract

Dr. Schultze-Florey serves as a senior physician in the Department of Haematology, Hemostaseology, Oncology, and Cell Therapy at Hannover Medical School. Since 2023, he leads the CAR-T cell program, treating patients with commercially available CAR-T products, as well as point-of-care produced CAR-T cells. His research focuses on the immune cell repertoire changes induced by cell therapy, including allogeneic stem cell transplantation and CAR-T cell therapy. He employs state-of-the-art methodology for longitudinal in-depth phenotyping of the immune cell repertoire, including multi-parameter spectral flow and TCR sequencing.

## Highlight publications

Odak I, Bayir LM, Riemann L, Sikora R, Schneider J, Xiao Y, Möhn N, Skripuletz T, Beutel G, Eder M, Ganzer A, Förster R, **Schultze-Florey CR**, Koenecke C (2024) Brief research report: in-depth immunophenotyping reveals stability of CD19 CAR T-cells over time. *Front Immunol* 15:1298598

**Schultze-Florey CR**, Kuhlmann L, Raha S, Barros-Martins J, Odak I, Tan L, Xiao Y, Ravens S, Hambach L, Venturini L, Stadler M, Eder M, Thol F, Heuser M, Förster R, Ganzer A, Prinz I, Koenecke C (2021) Clonal expansion of CD8<sup>+</sup> T cells reflects graft-versus-leukemia activity and precedes durable remission following DLI. *Blood Adv* 5(21):4485-4499

# Prof. Dr. Christian Sieben

Nano Infection Biology, Helmholtz Centre for Infection Research



## The virus-cell interface: Linking receptor organization to actin remodelling

### Abstract

My research investigates how respiratory viruses interact with host cells and initiate infection. We study how viruses activate cellular receptors, trigger signalling processes, and remodel the plasma membrane and actin cortex to promote entry. We combine advanced imaging, quantitative infection models, and perturbation approaches. Future work will expand this program toward respiratory mucus as a barrier in zoonotic virus transmission and toward preparedness-oriented platforms for emerging respiratory viruses.

### Highlight publications

Schlegel J, **Sieben C** (2026) Organizing the interface-Plasma membrane architecture and receptor dynamics in virus-cell interactions. FEBS Lett doi: 10.1002/1873-3468.70347. (in press). Review

Broich L, Wullenkord H, Osman MK, Fu Y, Müsken M, Reuther P, Brönstrup M, **Sieben C** (2025) Single influenza A viruses induce nanoscale cellular reprogramming at the virus-cell interface. Nat Commun 16(1):3846

# Prof. Dr. Natalia Torow

Early Life Immunity, Helmholtz Centre for Infection Research



## Tolerance as resilience: How the neonatal liver balances infection control and tissue protection

### Abstract

Early-life immune development shapes how tissues respond to infection and inflammation. Our work investigates how neonatal tissue environments, particularly the liver and intestinal mucosa, establish tolerance while preserving protective immunity. We study how regulatory T cells, antigen-presenting cells and epithelial barriers control infection outcome, immune-mediated tissue damage and long-term disease susceptibility. Future work aims to identify developmental pathways that can be targeted to improve immune resilience and vaccination in early life.

### Highlight publications

Stange EL, Nguyen TH, Mendoza D, Gomes AL, Kohlhepp MS, Pes J, Al Bounny S, Brueck J, Cetiner Y, Moerbe U, Ugur M, Kalbermatter C, Lopez-Scarim J, Dupont A, Jennings SAV, Heckmann J, Silva-Sanchez A, Runge S, Kuppe C, Pabst O, Clavel T, Viemann D, Rosshart SP, Cerovic V, Ganai-Vonarburg SC, Guillot A, Billerbeck E, Hornef MW, **Torow N** (2026) Neonatal liver niches program T cell tolerance. bioRxiv (Preprint) 2026.01.13.698576

**Torow N**, Li R, Hitch TCA, Mingels C, Al Bounny S, van Best N, Stange EL, Simons B, Maié T, Rüttger L, Gubbi NMKP, Abbott DA, Benabid A, Gadermayr M, Runge S, Treichel N, Merhof D, Rosshart SP, Jehmlich N, Hand TW, von Bergen M, Heymann F, Pabst O, Clavel T, Tacke F, Lelouard H, Costa IG, Hornef MW (2023) M cell maturation and cDC activation determine the onset of adaptive immune priming in the neonatal Peyer's patch. Immunity 56(6):1220-1238

# PD Dr. med. Stephan Traidl

Department of Dermatology and Allergy, Hannover Medical School



## Eczema herpeticum - severe herpes infection in atopic dermatitis

### Abstract

My research combines clinical dermatology with immunology and bioinformatics. I focus on inflammatory skin diseases, above all atopic dermatitis, together with allergology and the mechanisms of impaired skin barrier and antiviral immunity. In clinical trials and health services research, I study why some patients are prone to superinfections such as eczema herpeticum and how disease courses can be improved in everyday care. Bioinformatic analyses of different omics technologies and real-world data help identify endotypes. In the future, I aim to characterise markers of the skin's infection resilience for prevention and personalised therapy.

### Highlight publications

**Traidl S**, Kienlin P, Begemann G, Klug I, Döhner K, Moennig E, Sühs KW, Schwenkenbecher P, Roesner LM, Werfel T (2026) Autoantibodies against IFN- $\gamma$  in a subgroup of patients with atopic dermatitis and a history of eczema herpeticum. *J Allergy Clin Immunol* 157(4):989-992

**Traidl S**, Harries L, Kienlin P, Begemann G, Roesner LM, Werfel T (2023) Dupilumab strengthens herpes simplex virus type 1-specific immune responses in atopic dermatitis. *J Allergy Clin Immunol* 152(6):1460-1469.e5

# Dr. Jakob Wirbel

Microbial Precision Genomics, Helmholtz Centre for Infection Research



## Investigating gut microbiome dynamics in allo-HCT and beyond

### Abstract

The goal of the “Precision Microbial Genomics” group, led by Jakob Wirbel, is to understand the evolution and variation of microbial genomes in the human gut microbiome and how this relates to human diseases. To this end, the group analyses long-read metagenomic sequencing data, which allows for the identification of structural variations in microbial genomes, for example caused by the integration of prophages. A second focus is the dynamic of the gut microbiome in individuals undergoing allogeneic hematopoietic cell transplantation and how it relates to medication and therapy outcome.

### Highlight publications

**Wirbel J**, Hickey AS, Chang D, Enright NJ, Dvorak M, Chanin RB, Schmidtke DT, Bhatt AS (2026) Long-read metagenomics reveals phage dynamics in the human gut microbiome. *Nature* 649(8098):982-990

**Wirbel J**, Saber W, Martens MJ, Peled JU, Andermann TM, Fei T, Brooks EF, Doyle B, Pincus NB, Jenq RR, Bar M, Bolaños-Meade J, Bratrude B, Chhabra S, Choi SW, Clark W, Das S, Elmariah H, Gooptu M, Holtan SG, Jones RJ, Levine JE, Logan BR, Al Malki MM, Murthy HS, Rashidi A, Rezvani AR, Riches ML, Runaas L, Sandhu K, Spahn A, Sung AD, van den Brink MRM, Horowitz MM, Hamadani M, Kean LS, Perales MA, Bhatt AS (2026) Differential effects of two common GVHD prophylaxis regimens on the gut microbiome: Results from the BMT CTN 1801 study. *bioRxiv* (Preprint) 19:2026.02.19.706769

## Notes

## Notes

## Notes

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