

Research Groups at IMMEI

Institute of Molecular Medicine & Experimental Immunology (IMMEI), University Hospital Bonn

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Institute administration and key contacts

- **Institute Management:** Lucie Hrvat-Delforge
 - **Science Management:** Dr. Johanna Breuer
 - **Flow Cytometry Core Facility Manager:** Prof. Natalio Garbi
 - **Technical Core Facility Manager:** Andreas Dolf
 - **iFET Management:** Daniela Krauss
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Research groups

Prof. Dr. Christian Kurts Laboratory

Core focus

- Kidney immunology and inflammatory kidney disease mechanisms
- Antigen presentation and dendritic cell biology in tissue inflammation
- Translational immunology linking experimental models to clinical nephrology

Typical models and approaches

- Mouse models of glomerulonephritis and inflammatory kidney disease
- Flow cytometry-based immune phenotyping and tissue immunology
- Cleared tissue imaging and computational pathology
- Innate immune sensing and interferon-driven inflammatory pathways

Selected recent/representative publications

- *Kidney immunology from pathophysiology to clinical translation* — Nat Rev Immunol

- *Residence of mice in metabolic cages reduces experimental kidney inflammation through stress-induced glucocorticoids* — JCI Insight
 - *Low-dose glucocorticoids attenuate crescentic glomerulonephritis by inhibiting the local differentiation of proinflammatory neutrophils* — Sci Transl Med
 - *Monocyte-Derived Macrophages Aggravate Pulmonary Vasculitis via cGAS/STING/IFN-Mediated Nucleic Acid Sensing* — J Exp Med
 - *Determining Individual Glomerular Proteinuria and Periglomerular Infiltration in a Cleared Murine Kidney by a 3D Fast Marching Algorithm* — Kidney Int
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Prof. Dr. Natalio Garbi Laboratory

Core focus

- Antigen presentation and immune regulation during infection and inflammation
- Balancing protective immunity with immune-mediated pathology
- Tissue-resident and infiltrating immune cell interactions

Typical models and approaches

- Mouse models of lung infection and inflammation
- Viral and bacterial infection systems
- Multi-parameter flow cytometry and tissue imaging
- Reporter mouse strains and conditional immune cell perturbation

Selected recent/representative publications

- *Opposing roles of resident and infiltrating immune cells in the defense against Legionella longbeachae via IL-18R/IFN- /ROS axis in mice* — Mucosal Immunology
 - *Rapid Protection against Viral Infections by Chemokine-Accelerated Post-Exposure Vaccination* — Frontiers in Immunology
 - *Conditional NKT Cell Depletion in Mice Reveals a Negative Feedback Loop That Regulates CTL Cross-Priming* — Journal of Immunology
 - *Interferon-Induced IL-10 Drives Systemic T-Cell Dysfunction during Chronic Liver Injury* — Journal of Hepatology
 - *Cigarette Smoke Depletes Alveolar Macrophages and Delays Clearance of Legionella pneumophila* — AJP Lung
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Prof. Dr. Veronika Lukacs-Kornek Laboratory

Core focus

- Immune-stromal interactions in tissue homeostasis and disease
- Stromal cell biology and extracellular matrix remodeling
- Chronic inflammatory disease contexts including liver and lung pathology

Typical models and approaches

- Mouse models of tissue inflammation and fibrosis
- Stromal cell isolation and high-dimensional flow cytometry
- Multi-omics approaches to tissue remodeling
- Liver and lung immunopathology

Selected recent/representative publications

- *Global matrisome changes in obese lung are linked to fibroblastic stroma and premature aging* — Cell Reports
 - *Isolation, Purification, and Comprehensive Flow Cytometry Assessment of Lung Stromal Cells* — Current Protocols
 - *Increased Type-I Interferon Level Is Associated with Liver Damage and Fibrosis in Primary Sclerosing Cholangitis* — Hepatology Communications
 - *The role of dendritic cells in NASH: friends or foes?* — Frontiers in Immunology
 - *Inflammatory responses on the road from NASH to HCC* — Frontiers in Immunology
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Prof. Dr. Zeinab Abdullah Laboratory

Core focus

- Adaptive immune regulation during chronic inflammation
- T cell differentiation and dysfunction in tissue environments
- Systemic immune consequences of chronic organ inflammation

Typical models and approaches

- Mouse models of chronic liver inflammation and injury
- Infection models including LCMV and bacterial challenge
- High-dimensional flow cytometry and functional T cell assays
- Tissue-resident versus systemic immune profiling

Selected recent/representative publications

- *Interferon-Induced IL-10 Drives Systemic T-Cell Dysfunction during Chronic Liver Injury* — Journal of Hepatology
 - *Lymph nodes fuel KLF2-dependent effector CD8+ T cell differentiation during chronic infection and checkpoint blockade* — Nature Immunology
 - *Transcriptional regulator SATB1 limits CD8+ T cell population expansion and effector differentiation in chronic infection and cancer* — Nature Immunology
 - *Lymph-node-derived stem-like but not tumor-tissue-resident CD8+ T cells fuel anticancer immunity* — Nature Immunology
 - *Determining Individual Glomerular Proteinuria and Periglomerular Infiltration in a Cleared Murine Kidney by a 3D Fast Marching Algorithm* — Kidney International
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Prof. Dr. Tim Rollenske Laboratory

Core focus

- Mucosal immunology and antibody-mediated host defense
- Functional antibody responses and host–microbiota interactions
- Antibody discovery and recombinant antibody engineering

Typical models and approaches

- Single-cell B cell isolation and antibody cloning
- Recombinant antibody expression and purification

- Mouse models of mucosal colonisation and immunity
- Functional antibody testing in vivo and in vitro

Selected recent/representative publications

- *Efficient Expression and Purification of Recombinant Mouse Dimeric IgA* — European Journal of Immunology
 - *Expression Cloning of Antibodies from Single Human B Cells* — Methods in Molecular Biology
 - *Parallelism of intestinal secretory IgA shapes functional microbial fitness* — Nature
 - “*ELO, world!*” – *Early-life origins of B cells* — Immunity
 - *Cross-specificity of protective human antibodies against Klebsiella pneumoniae* — Nature Medicine
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Dr. Janine Becker-Gotot Laboratory

Core focus

- Immune tolerance and regulatory T cell biology
- Antigen-specific immune regulation
- Mechanisms linking immune regulation and tissue pathology

Typical models and approaches

- Mouse models of immune tolerance and regulation
- Regulatory T cell phenotyping and functional assays
- Kidney and tissue inflammation models
- Translational immune tolerance contexts

Selected recent/representative publications

- *Immune Tolerance against Infused FVIII in Hemophilia A Is Mediated by PD-L1+ Regulatory T Cells* — Journal of Clinical Investigation
 - *Renal IL-23-Dependent Type 3 Innate Lymphoid Cells Link Crystal-induced Inflammasome Activation with Kidney Fibrosis* — Journal of Immunology
 - *Rapid Protection against Viral Infections by Chemokine-Accelerated Post-Exposure Vaccination* — Frontiers in Immunology
 - *Antibody cross-reactivity between casein and myelin-associated glycoprotein results in central nervous system demyelination* — PNAS
 - *Immune regulation in tissue inflammation* — representative recent work
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Prof. Dr. Axel Kallies Laboratory

Core focus

- T cell differentiation and fate decisions
- Stem-like and exhausted T cell states
- T cell function in chronic infection, cancer, and tissue contexts

Typical models and approaches

- Mouse models of chronic infection and cancer
- Tissue-resident versus lymphoid T cell compartment analysis

- Transcriptional regulation of T cell fate
- High-dimensional immune profiling

Selected recent/representative publications

- *Lymph-node-derived stem-like but not tumor-tissue-resident CD8+ T cells fuel anticancer immunity* — Nature Immunology
- *Lymph nodes fuel KLF2-dependent effector CD8+ T cell differentiation during chronic infection and checkpoint blockade* — Nature Immunology
- *Transcriptional regulator SATB1 limits CD8+ T cell population expansion and effector differentiation in chronic infection and cancer* — Nature Immunology
- *Stem-like tissue-resident memory T cells control functional heterogeneity and reactivation of T cell memory in the intestine* — Science Immunology
- *The co-inhibitory receptor TIGIT promotes tissue-protective functions in T cells* — Nature Immunology