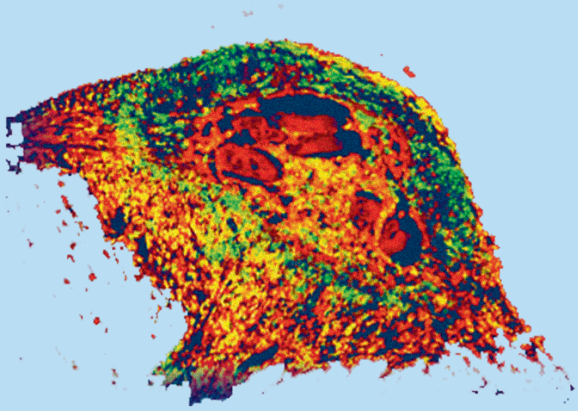
Friedrich-Alexander-Universität
Erlangen-Nürnberg

Profile Center Immunomedicine

Spring 2024

CONTENT



Scientific Highlight, p. 5

Activation of STAT6 signaling in intestinal epithelial cells protects mice from chronic infection during challenge with the intestinal worm parasite *Heligmosomoides polygyrus bakeri.*

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It is highly desirable that the guest seminars are not only attended by our students and doctoral candidates, but also by experienced scientists.

Dear colleagues and friends,

This is the first newsletter of the new *FAU Profile Center Immunomedicine (FAU I-MED),* which is the successor of our previous *FAU Interdisciplinary Center Medical Immunology Campus Erlangen (MICE)* that was founded in 2009. As many of you know, several years ago the university leadership had decided to transform some of the interdisciplinary centers of FAU into FAU profile centers, research centers or competence centers. FAU I-MED was officially established as a profile center by the university leadership in May 2023. The founding meeting of FAU I-MED with the election of the new executive board took place on November 29, 2023. In this context, I wish to thank the president and vice-president of FAU, Prof. Joachim Hornegger and Prof. Georg Schett, as well as the dean of the medical faculty, Prof. Markus Neurath, for their support in establishing FAU I-MED and Dr. Ilka Knippertz, the scientific coordinator of MICE, for her invaluable help with the FAU I-MED application and the new homepage.

Despite the transition from "MICE" to "FAU I-MED", new statutes and a new logo, several of the core aims of the center will remain the same. These include the development of novel research concepts within the center, joint endeavors for new research consortia in the field of immunology and infectious diseases, the promotion of young immunologists, the organization of meetings and conferences and – last but not least – our weekly seminar series with national and international guests every Tuesday during the semester.

The latter has now a tradition of more than 40 years. The FAU I-MED executive board recently decided to return to the original seminar time at 5.15 p.m., because during the past two semesters the lunchtime seminars at 12.30 p.m. did not attract more FAU I-MED faculty members and principal investigators as compared to late afternoon seminars. It is highly desirable that the guest seminars are not only attended by our numerous students and doctoral candidates, but also by experienced scientists in order to stimulate fruitful as well as controversial discussions. With respect to the pre-seminar scientific meetings and the after-seminar dinner, I appeal to all FAU I-MED faculty members to have their young group members participating in these events, which are very important for networking, but also for exchanging scientific news and ideas. Finally, I would like to emphasize that FAU I-MED will be subject to regular evaluations by the university leadership, which should be another incentive for all members to participate actively in the development of FAU I-MED.

Since our last newsletter, the community of FAU immunologists succeeded in the prolongation and establishment of new DFG-funded research consortia (see under the heading "People" in this newsletter). At the same time, we had to cope with two bitter decisions: the discontinuation of the highly successful CRC1181 "Resolution of Inflammation" and the rejection of the excellence cluster preproposal "Reset". It is hard to accept that these failures were based on a fair evaluation of our scientific achievements and research concepts. However, better than falling into depression is to adopt an aphorism by Max Planck: "Even a disappointment, if only it is thorough and final, is a step forward."

Prof. Christian Bogdan

Spokesperson of the FAU Profile Center Immunomedicine

How macrophages use a metabolic product to combat the Q fever pathogen

Inducible expression of ACOD1 generates itaconate that inhibits replication of *Coxiella burnetii* in murine and human macrophages

Lisa Kohl, Nur a Alam Siddique, Barbara Bodendorfer, Anja Lührmann, Roland Lang

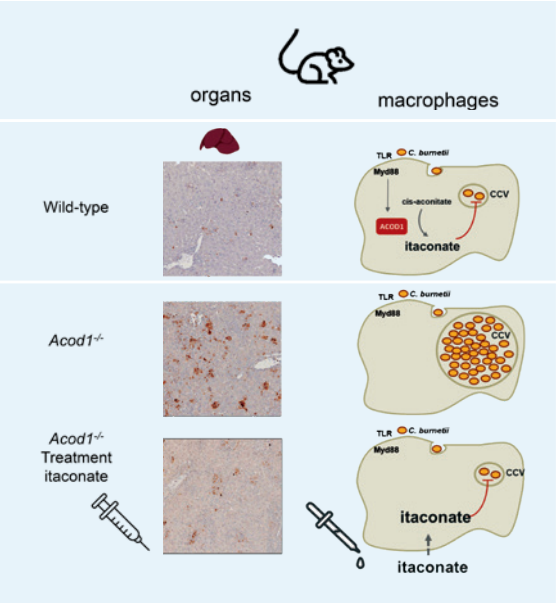
Mikrobiologisches Institut – Klinische Mikrobiologie, Immunologie und Hygiene, Universitätsklinikum Erlangen, FAU Erlangen-Nürnberg

The bacterium *Coxiella (C.) burnetii* predominantly affects sheep and goats, where it is found in high concentration in the placenta and is released during lambing. If people inhale the bacterium, it can trigger severe pneumonia, known as acute Q fever. Outbreaks of Q fever occur every now and again, e.g., in the Netherlands between 2007 and 2010, when more than 4,000 people fell ill. *C. burnetii* is taken up by macrophages, where it replicates in the acidic environment of the phagolysosome. Usually, the immune system kills the bacteria and inflammation resolves within weeks. Some patients, however, develop a chronic form of Q fever that affects in particular the vascular system and is difficult to treat with antibiotics. It is not fully understood which immunological factors provide protection against chronic Q fever.

Recently, the research group of Prof. Dr. Roland Lang together with the group led by Prof. Dr. Anja Lührmann showed that production of the metabolic product itaconate by infected macrophages is an important defense mechanism against *C. burnetii*. Infection of mouse or human macrophages with *C. burnetii* induced the enzyme aconitate decarboxylase 1 (ACOD1) that generates itaconate. ACOD1-deficient macrophages failed to produce itaconate and to control replication of *C. burnetii*. Adding itaconate to macrophages in vitro and treating infected mice lacking the ACOD1 gene with itaconate brought bacterial growth under control. Interestingly, compared to mice, human macrophages produced considerably smaller quantities of itaconate and allowed *C. burnetii* to continue to grow. However, treatment with itaconate also inhibited the reproduction of bacteria in human cells.

Considering the limited options of treating chronic Q fever with antibiotics, the ACOD1-itaconate pathway could be an interesting candidate for new therapeutic approaches in Q fever.

L. Kohl, M. Siddique, B. Bodendorfer, R. Berger, A. Preikschat, C. Daniel, M. Ölke, E. Liebler-Tenorio, J. Schulze-Luehrmann, M. Mauermeir, K. T. Yang, I. Hayek, M. Szperlinski, J. Andrack, U. Schleicher, A. Bozec, G. Krönke, P. J. Murray, S. Wirtz, M. Yamamoto, V. Schatz, J. Jantsch, P. Oefner, D. Degrandi, K. Pfeffer, K. Mertens-Scholz, S. Rauber, C. Bogdan, K. Dettmer, A. Lührmann, R. Lang. Macrophages inhibit Coxiella burnetii by the ACOD1-itaconate pathway for containment of Q fever. *EMBO Mol Med* 2023; 15(2):e15931.



ACOD1 expression is induced in infected macrophages and generates itaconate. Lack of ACOD1 in mice allows replication of *C. burnetii* in vitro and *in vivo*. Supplementation of itaconate restores control of bacterial replication. Human macrophages also express ACOD1 but produce less itaconate.

A monoclonal Trd chain supports the development of the complete set of functional γδ T cell lineages

The entire functional spectrum of γδ T subsets develops with a monoclonal TCRδ chain inserted into the endogenous TCRδ locus

Anne Hahn, Lisa Vogg, Thomas Winkler

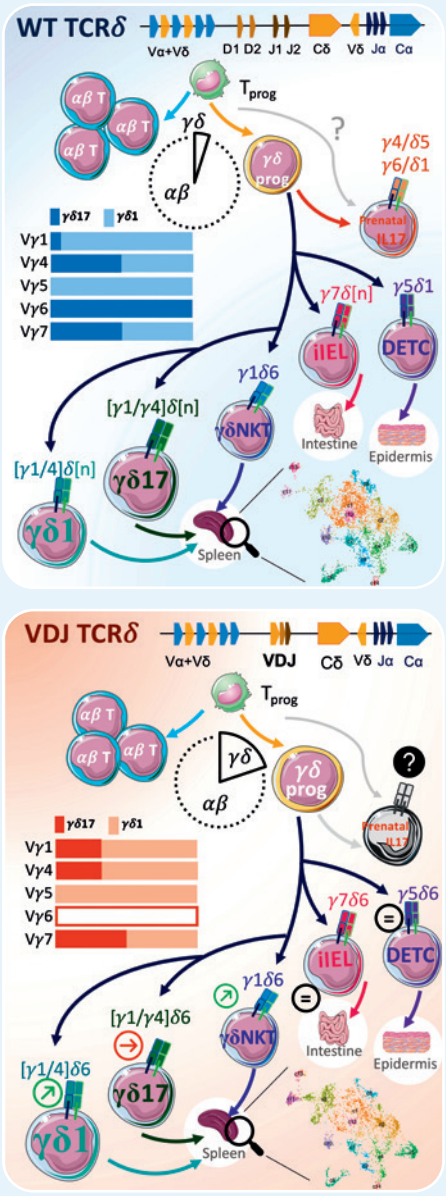
Chair of Genetics, Department of Biology, FAU Erlangen-Nürnberg

The clonal selection theory describes key features of adaptive immune responses of B and T cells. For αβ T cells and B cells, antigen recognition and selection principles are known at a detailed molecular level. For γδ T cells subsets, the role of the antigen receptor still remains poorly understood. In addition, the role of the γδ TCR specificity for the localization of γδ T cell subpopulations in the epithelia of skin, intestine and other mucosal tissue is unclear. We have recently described an adaptive-like γδ T cell response in murine cytomegalovirus infections that confers protection.

To understand better the role of the γδ TCR, we generated a genetic mouse model, in which for the first time a monoclonal TCRd chain was introduced at the correct location within the Trd gene locus by the CRISPR/Cas9 technology. Surprisingly, the entire functional spectrum of phenotypes of the γδ T cell subsets developed with a monoclonal TCRδ chain. Remarkably, dendritic epidermal T cells (DETCs) and intestinal intraepithelial γδ T cells were indistinguishable in the morphology and gene expression programs compared with the natural counterparts from wildtype mice. These data provide direct genetic evidence for the dominant role of Vγ5 and Vγ7 chains for these subsets.

In the thymus, the monoclonal TCRδ chain led to a 20-fold expansion of mature, Vγ1 T cells expressing NK-cell markers like NK1.1 and the lineage transcription factor PLZF encoded by the Zbtb16 gene. These cells were clearly positively selected in the thymus and were also found expanded in the spleen and intestinal tissues. Altogether, our data support dictation of developmental tropism together with adaptive-like recognition principles with a single antigen receptor. We can now use these mice for a much more detailed tracking of the γδ T cell response in MCMV infections.

A. M. Hahn, L. Vogg, S. Brey, A. Schneider, S. Schäfer, R. Palmisano, A. Pavlova, I. Sandrock, L. Tan, A. S. Fichtner, I. Prinz, S. Ravens, T. H. Winkler. A monoclonal Trd chain supports the development of the complete set of functional γδ T cell lineages. *Cell Rep* 2023; 42(3):112253.



Maintenance of functional heterogeneity of γδ T cell subsets in a mouse model expressing a monoclonal TCRδ chain. Under the expression of a transgenic VDJδ cassette (bottom picture), more T cell progenitors enter the γδ T cell lineage, leaving the αβ T cell subsets unchanged.

Th2-dependent STAT6-regulated genes in intestinal epithelial cells mediate larval trapping during secondary *Heligmosomoides polygyrus bakeri* infection

Activation of STAT6 signaling in intestinal epithelial cells protects mice from chronic infection during challenge with the intestinal worm parasite *Heligmosomoides polygyrus bakeri*

Stefanie Westermann[1], Christoph Schubart[1], Axel Dietschmann[2], Kirstin Castiglione[1], Daniel Radtke[1], David Voehringer[1]

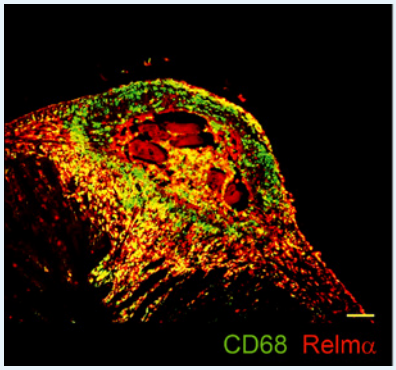
1 Department of Infection Biology, Universitätsklinikum Erlangen, Friedrich-Alexander Universität Erlangen-Nürnberg (FAU), Erlangen, Germany,

2 Junior Research Group Adaptive Pathogenicity Strategies, Leibniz Institute for Natural Product Research and Infection Biology– Hans Knöll Institute, Jena, Germany

Helminth infections constitute a major health problem with approximately 2 billion infected people. Infection of mice with the gastrointestinal helminth *Heligmosomoides polygyrus bakeri (Hpb)* serves as a model to study the cellular and molecular mechanisms of protective type 2 immunity. During secondary infection of wild-type mice, the *Hpb* larvae are trapped in the intestinal wall by an unknown immune mechanism and cannot return to the intestinal lumen, thus protecting the host from chronic infection as it occurs in primary *Hpb* infection. To investigate the role of activation of the key type 2 transcription factor STAT6 in different cell types, we performed secondary *Hpb* infections with various genetically modified mice. In a mouse line where STAT6 is only expressed in macrophages, we found that induction of alternatively activated macrophages (AAMs) and their STAT6-regulated genes is not sufficient to retain the larvae in the intestinal wall during secondary infection, which is in contrast to previous reports. Further, genetic ablation of arginase 1, a STAT6-regulated gene in AAMs, did not impair larval trapping, showing that arginase 1 is dispensable here. On the other hand, mice expressing constitutively active STAT6 in intestinal epithelial cells (IECs) were able to trap the larvae, even in the absence of CD4 T cells. In line, mice with a disruption of the STAT6 signaling axis in IECs were not protected during secondary *Hpb* infection, showing that STAT6 activation in IECs is essential for trapping of the larvae. Finally, T cell-specific deletion of IL-4/IL-13 resulted in loss of IEC activation and larval trapping. In summary, we show that while AAMs are not sufficient, T cell-derived IL-4/IL-13 and STAT6 activation in IECs are critical in protective host immunity during secondary *Hpb* infection.

S. Westermann, C. Schubart, A. Dietschmann, K. Castiglione, D. Radtke, D. Voehringer. Th2-dependent STAT6-regulated genes in intestinal epithelial cells mediate larval trapping during secondary Heligmosomoides polygyrus bakeri infection. *PLoS Pathog* 2023; 19(4):e1011296.

A



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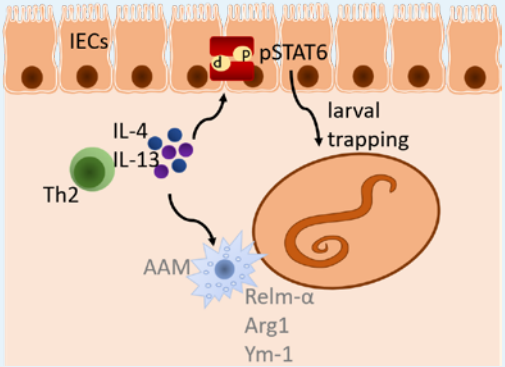

A Immunofluorescence stain of a trapped *Hpb* larva surrounded by AAMs (double positive for CD68 (green) and Relm-α (red)) in the submucosa of a BALB/c wild-type mouse day 9 after secondary infection.

B Schematic illustration of our findings: IL-4 and IL-13 from Th2 cells activate AAMs and STAT6 in IECs with the latter being essential for the protective trapping of the larvae.

Antiviral IgG4 responses induced by mRNA vaccination

Longitudinal analysis of vaccine-induced antibody responses revealed an unexpected class switch toward noninflammatory, spike-specific IgG4 antibodies

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1 Mikrobiologisches Institut – Klinische Mikrobiologie, Immunologie und Hygiene, Universitätsklinikum Erlangen, FAU Erlangen-Nürnberg;

2 Chair of Genetics, Department of Biology, FAU Erlangen-Nürnberg;

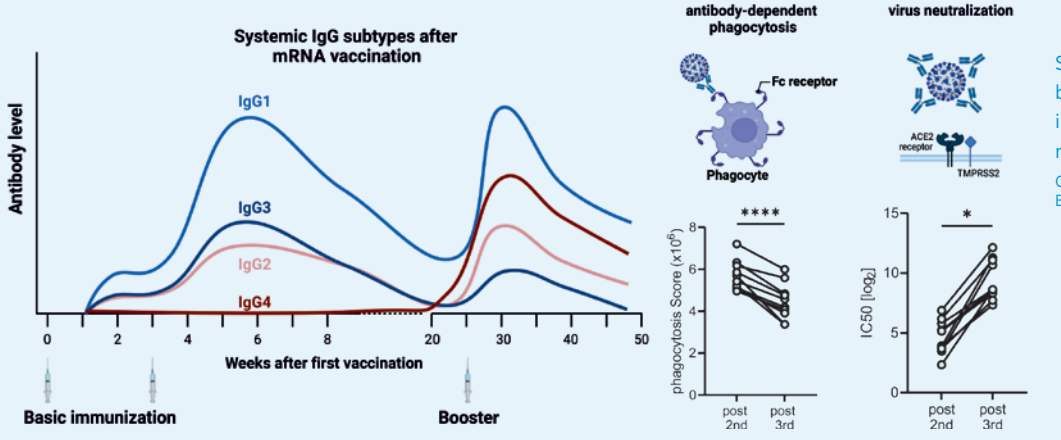
3 Institut für Klinische und Molekulare Virologie, Universitätsklinikum Erlangen, FAU Erlangen-Nürnberg

RNA vaccines against SARS-CoV-2 have been efficient in inducing spike-specific antibodies and were an important weapon to combat the recent pandemic. The protective function of virus-specific antibodies for prevention of infections and disease progression likely depends not only on virus neutralization activity, but also on secondary effector functions mediated by binding to Fc-gamma receptors on various immune cells. In a longitudinal analysis of SARS-CoV-2 mRNA vaccines, we detected an unexpected increase of spike-specific IgG4 antibodies six months after the second vaccination, which further increased after a third booster vaccination. Single-cell sequencing revealed a proportional increase of IgG4-switched memory B cells as a potential consequence of long-lasting germinal center reactions and consecutive events of class switching. Interestingly, an increase of spike-specific IgG4 antibodies was found only after vaccinations with the two mRNA vaccines and not in individuals with prior SARS-CoV-2 infections or adenoviral vector immunizations.

Notably, we measured reduced antibody-mediated phagocytic activity and complement deposition using sera obtained after the third immunization, in parallel to higher proportions of anti-spike IgG4 antibodies. Because Fc-mediated effector functions might be critical for viral clearance, an increase in IgG4 subclasses might result in longer viral persistence in case of infection. However, it is also conceivable that anti-inflammatory Fc-mediated effector functions reduce immunopathology, whereas virus is still being neutralized via high-avidity antibody variable regions.

Further investigations are needed to clarify the precise immunological mechanisms driving this response and to evaluate whether an IgG4 antibody response affects subsequent viral infections and booster vaccinations.

P. Irrgang, J. Gerling, K. Kocher, D. Lapuente, P. Steininger, K. Habenicht, M. Wytopil, S. Beileke, S. Schäfer, J. Zhong, G. Ssebyatika, T. Krey, V. Falcone, C. Schülein, A. S. Peter, K. Nganou-Makamdop, H. Hengel, J. Held, C. Bogdan, K. Überla, K. Schober, T. H. Winkler, M. Tenbusch. Class switch toward noninflammatory, spike-specific IgG4 antibodies after repeated SARS-CoV-2 mRNA vaccination. *Sci Immunol* 2023; 8(79):eade2798.



Spike-specific antibody responses induced by repeated mRNA vaccination.

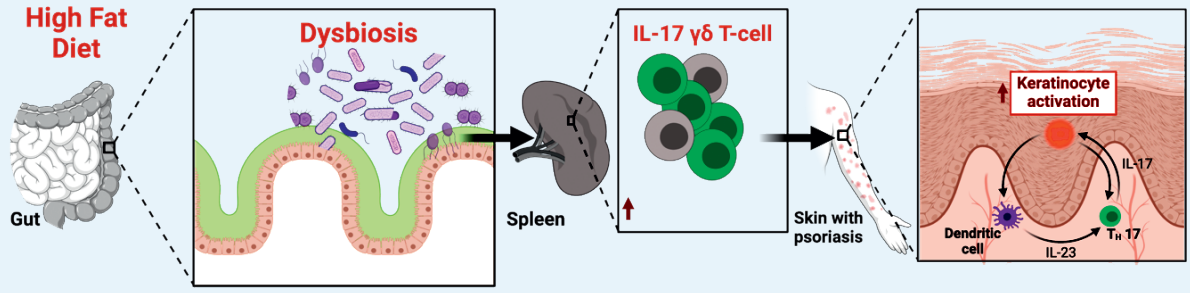
Created with BioRender.com

High-fat-diet-associated intestinal microbiota exacerbates psoriasis-like inflammation by enhancing systemic γδ T cell IL-17 production

High-fat diet worsens psoriasis-like skin inflammation via the gut

Aline Bozec, Koshiro Sonomoto

Department of Internal Medicine 3, Universitätsklinikum Erlangen, FAU Erlangen-Nürnberg



High-fat diet (HFD) facilitates a systemic IL-17 mediated γδ T cell response in a microbiota-dependent manner, exacerbating psoriasis-like inflammation. Administration of *Akkermansia muciniphila* effectively suppressed HFD induced enhancement of psoriatic disease.

While genetics play a key role in psoriasis, metabolic disorders like obesity and diabetes are surprisingly common in these patients and dietary interventions improve treatment response. However, the link between metabolic changes and the inflammatory nature of psoriasis remains unclear. One possible connection is the gut microbiome. Changes in this ecosystem have been observed in both psoriatic skin and joint diseases. The gut microbiome plays a crucial role in regulating metabolism as seen in germ-free mice which gain weight faster when given bacteria. In obese individuals, there is a shift in intestinal bacteria (dysbiosis), which potentially leads to diseases like atherosclerosis and diabetes. Some gut bacteria exert immunoregulatory effects. *Akkermansia muciniphila,* for example, helps maintaining gut barrier function and intestinal immune balance and counteracts harmful effects of high-fat diets. Notably, bacterial endotoxins, linked to psoriatic inflammation, are stimulated by factors like high-fat diets and can trigger key inflammatory molecules in psoriasis. Therefore, we investigated how diet-induced changes in gut bacteria may influence psoriatic skin inflammation and immune responses.

Mice fed with a high-fat diet (HFD) for 8 weeks developed significantly more severe psoriasis-like skin inflammation compared to those on high-protein or high-carb diets. The clinical worsening involved the skin infiltration by immune cells like neutrophils and T cells, which was fueled by high levels of IL-17 and chemokines. Notably, HFD alone, even without an external trigger, ignited a systemic IL-17 response – mainly from γδT cells located in the spleen. These findings suggest that HFD makes mice susceptible to skin flare-ups triggered by imiquimod as a model for psoriasis. Treating mice with vancomycin, an antibiotic directed against Gram-positive bacteria, reversed the HFD effect, suggesting that certain gut microbiota play a key role. Mice on HFD treated with the Gram-negative bacterium *Akkermansia muciniphila* showed reduced skin inflammation, restored gut barrier function and reduced systemic IL-17 levels, even if the bacterium was heat-killed. Thus, *Akkermansia* helps repairing the damage caused by HFD and counteracts the inflammatory effects of HFD on the skin. Together, our results reveal a critical link between dietary fat, intestinal microbiota and systemic (skin) inflammation which opens new avenues for the therapy of psoriasis.

K. Sonomoto, R. Song, D. Eriksson, A. M. Hahn, X. Meng, P. Lyu, S. Cao, N. Liu, R. V. Taudte, S. Wirtz, Y. Tanaka, T. H. Winkler, G. Schett, D. Soulat, A. Bozec. High-fat-diet-associated intestinal microbiota exacerbates psoriasis-like inflammation by enhancing systemic γδ T cell IL-17 production. *Cell Rep* 2023; 42(7):112713.

Plasmodium falciparum gametocytes display global chromatin remodeling during sexual differentiation

Malaria parasites reorganize their chromatin in a sex-specific fashion to regulate developmental gene expression programs

Myriam Jeninga, Michaela Petter

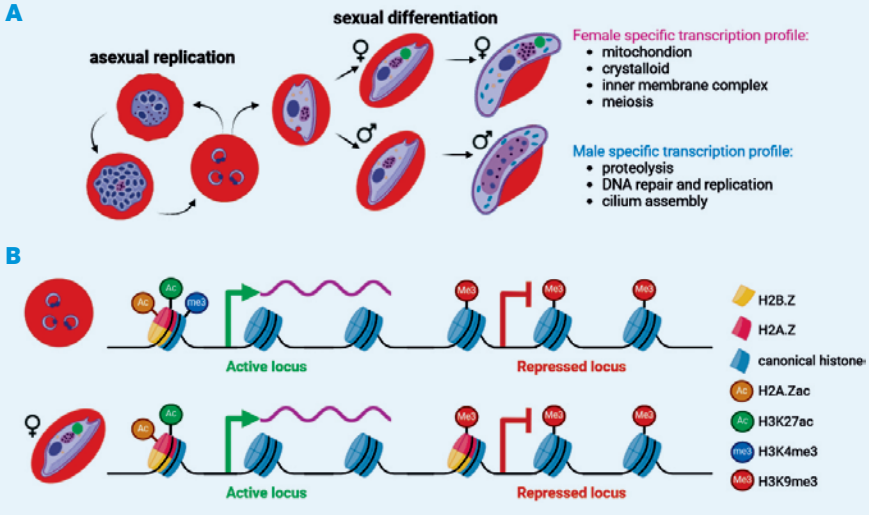
Mikrobiologisches Institut – Klinische Mikrobiologie, Immunologie und Hygiene, Universitätsklinikum Erlangen, FAU Erlangen-Nürnberg

The protozoan parasite *Plasmodium falciparum* causes the most severe clinical forms of human malaria. Continuous asexual replication cycles of the parasites in mature red blood cells trigger the typical symptoms of malaria. For the transmission of *P. falciparum*, some parasites need to commit to a sexual differentiation path and develop into male or female gametocytes, which fuse to a zygote upon ingestion by an Anopheles mosquito. Despite the critical role of sexual development in the *Plasmodium* transmission cycle, the molecular mechanisms governing sex determination remain poorly understood.

Epigenetic gene regulation is crucial for cellular differentiation processes in all eukaryotic cells. To understand, how the chromatin landscape shapes the sex-specific transcription profiles of developing male and female gametocytes, we mapped the genome-wide distribution of relevant histone modifications and variants in purified parasites of each sex as well as in asexual parasites. Correlation with RNAseq data revealed that acetylation of histone 3 lysine 27 (H3K27ac) strongly predicts active gene expression in all parasite stages. However, in contrast to asexual parasites, in female gametocytes this was independent of the usually transcription-associated histone modification H3K4me3. Comparison of the heterochromatin profiles predicted a ncRNA and several protein coding genes as candidates for a function in male and female sex determination. Only in female gametocytes the histone variant PfH2A.Z was globally redistributed and strongly enriched in the heterochromatin compartment, creating a unique chromatin state that may be important for meiotic recombination in the mosquito.

Together, these data suggest that the histone code modulating gene expression and shaping the chromatin structure in asexual and sexual *Plasmodium* parasites is highly specific. Further investigations will focus on identifying the responsible chromatin remodeling enzymes.

M. D. Jeninga, J. Tang, S. A. Selvarajah, A. G. Maier, M. F. Duffy, M. Petter. Plasmodium falciparum gametocytes display global chromatin remodelling during sexual differentiation. *BMC Biol* 2023; 21(1):65.



A Asexually replicating parasites and sexually differentiated male and female gametocytes of *P. falciparum* show characteristic transcriptional signatures.

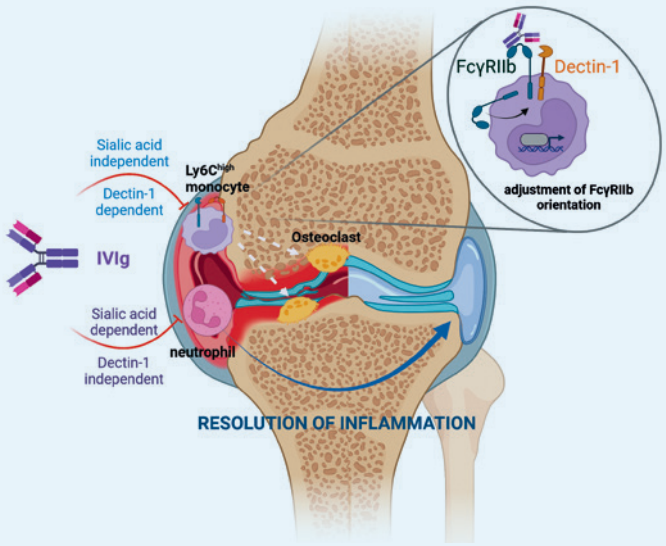
B The stage specific transcription signatures correlate with divergent chromatin states conveyed by the combinatorial enrichment of the histone variants H2A.Z and H2B.Z and particular histone acetylations and methylations.

Immunoglobulin G-dependent inhibition of inflammatory bone remodeling requires pattern recognition receptor Dectin-1

Intravenous immunoglobulins (IVIg) efficiently trigger resolution of inflammation by reprogramming inflammatory monocytes via a Dectin-1-dependent modulation of IVIg binding to the inhibitory receptor FcγRIIb

Falk Nimmerjahn

Chair of Genetics, Department of Biology, FAU Erlangen-Nürnberg



Pathway of IVIg mediated resolution of bone joint inflammation. IVIg modulates main innate effector cell types to trigger resolution of joint and bone inflammation. While an IgG sialylation dependent pathway inhibits neutrophil influx into the joint, a Dectin-1/FcγRIIb-dependent pathway prevents monocyte differentiation into osteoclasts, thereby preventing inflammatory bone loss.

Immunoglobulin G (IgG) antibodies are major drivers of inflammation during infectious and autoimmune diseases. In pooled serum IgG (IVIg), however, antibodies have a potent immunomodulatory and anti-inflammatory activity, but how this is mediated is unclear. We studied IgG-dependent initiation of resolution of inflammation in cytokine- and autoantibody-driven models of rheumatoid arthritis and found that IVIg sialylation inhibited joint inflammation, whereas inhibition of osteoclastogenesis was sialic acid-independent. Instead, IVIg-dependent inhibition of osteoclastogenesis was abrogated in mice lacking receptors Dectin-1 or FcγRIIb. Atomistic molecular dynamics simulations and super-resolution microscopy revealed that Dectin-1 promoted FcγRIIb membrane conformations that allowed productive IgG binding and enhanced interactions with mouse and human IgG subclasses. IVIg reprogrammed monocytes via FcγRIIb-dependent signaling that required Dectin-1. Our data identify a pathogen-independent function of Dectin-1 as a co-inhibitory checkpoint for IgG-dependent inhibition of mouse and human osteoclastogenesis. These findings may have implications for therapeutic targeting of autoantibody and cytokine-driven inflammation.

The project was funded by the CRC1181.

M. Seeling, M. Pöhnl, S. Kara, N. Horstmann, C. Riemer, M. Wöhner, C. Liang, C. Brückner, P. Eiring, A. Werner, M. Biburger, L. Altmann, M. Schneider, L. Amon, C. H. K. Lehmann, S. Lee, M. Kunz, D. Dudziak, G. Schett, T. Bäuerle, A. Lux, J. Tuckermann, T. Vögtle, B. Nieswandt, M. Sauer, R. A. Böckmann, F. Nimmerjahn. Immunoglobulin G-dependent inhibition of inflammatory bone remodeling requires pattern recognition receptor Dectin-1. *Immunity* 2023; 56(5):1046-1063.e1047.

Prof. Dr. med. Martin Röllinghoff *1941 †2022

The Friedrich-Alexander Universität Erlangen-Nürnberg and the Universitätsklinikum Erlangen mourns the loss of the former director of the Institute for Clinical Microbiology, Immunology and Hygiene.

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We bid farewell to a remarkable individual whose contributions to the fields of immunology and infectious diseases have left indelible marks. Prof. em. Dr. med. Martin Röllinghoff, a distinguished figure in the academic world and former president of the DGfI, passed away on November 22, 2022, leaving behind a legacy that will be deeply respected and remembered by all who had the privilege of knowing him.

Born April 1, 1941, in Hamburg, he studied medicine in Freiburg (i.Br.), Vienna and Tübingen, before he delved into immunology under Paul Klein's mentorship in 1968 as scientific co-worker at the Institute of Medical Microbiology of the University of Mainz. In 1971, he received a postdoctoral training fellowship from the DFG, which took him to the Walter and Eliza Hall Institute (WEHI) in Melbourne (Australia), where he worked for two years with the research groups of Noel Warner and Sir Gustav Nossal on various tumour immunological topics.

After his return to Germany, Martin worked for 10 years at the institute in Mainz on the activation, differentiation and function of cytotoxic T cells, where he and his companion Hermann Wagner made fundamental discoveries in the field. In 1983, he became full professor of medical microbiology and director of the Institute of Clinical Microbiology and Infection Hygiene at FAU in Erlangen, where he developed his passion for infectious disease immunology. In the 24 years until his retirement in 2007, he and the various research groups at the institute made major contributions in the field of host-pathogen interaction research. In 1990, together with his friend Professor Joachim Kalden, he co-founded research initiatives such as the CRC 263. He also played a pivotal role in establishing the Interdisciplinary Centre for Clinical Research (IZKF) at the Universitätsklinikum Erlangen in 1996, fostering translational and clinical immunology.

Throughout his illustrious career, Martin received numerous honors, including the induction into the National Academy of Science Leopoldina in 2001 and the prestigious Rudolf Leukart Medal of the German Society for Parasitology in 2002. Martin was renowned for his mentorship, leadership and his dedication to advancing scientific knowledge and nurturing future generations of researchers. Even after his retirement, he remained engaged, contributing to various institutions and advisory boards until his passing. We bid farewell to a visionary leader, mentor and friend, with profound respect and appreciation for his remarkable life and achievements.

Adopted and modified from the obituary on Prof. Martin Röllinghoff
by Prof. Christian Bogdan, published in Eur. J. Immunol. 2024;54:2350852.

Prof. Dr. med. Georg Schett

Great honor for FAU I-MED immunologist Georg Schett, who is one of the 10 Leibniz Prize awardees in 2023

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Professor Dr. med. Georg Schett, Director of the Department of Medicine 3 – Rheumatology and Immunology at the Universitätsklinikum Erlangen and the FAU Erlangen-Nürnberg and FAU Vice President for Research, has been awarded the prestigious Gottfried Wilhelm Leibniz Prize 2023. The award, presented by the German Research Foundation (DFG) and endowed with 2.5 million euros for five years of research, recognizes Georg Schett's leading role as an expert in the field of inflammatory rheumatic diseases.

His research focuses on understanding the development and chronicity of autoimmune diseases. Recently, he achieved a milestone by pioneering the world's first therapy of systemic lupus erythematosus (SLE) with genetically modified T cells. The therapy acted like a "reset button," resulting in the complete and permanent disappearance of the disease. These ground-breaking findings offer promising prospects for effectively curing severe forms of autoimmune diseases in the future.

We cordially congratulate Prof. Schett on this award and wish him every success for his future research work.

PD Dr. rer. nat. Heiko Bruns

FAU I-MED immunologist Heiko Bruns received the Pro Scientia award of the Eckhart Buddecke Foundation

PD Dr. rer. nat. Heiko Bruns (Department of Medicine 5 – Haematology and Oncology) has been awarded with the Pro Scientia award – offered by the Eckhart-Buddecke Foundation for outstanding achievements in basic medical research in the amount of 10,000 euros – for the work "β2-microglobulin triggers NLRP3 inflammasome activation in tumor-associated macrophages to promote multiple myeloma progression", Immunity, 2021; 54(8):1772-1787. In his research, Heiko Bruns was able to find out that macrophages that "overeat" this certain protein can promote cancer instead of fighting it. This discovery could lead to completely new therapeutic approaches in treating bone marrow cancer.

We congratulate Heiko Bruns and his team on the award and wish them success for their future studies.

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Prof. Dr. med. Ricardo Grieshaber-Bouyer

Appointment of Prof. Dr. med. Ricardo Grieshaber-Bouyer as Professor for Clinical Systems Immunology

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We welcome Ricardo Grieshaber-Bouyer as new Professor for Clinical Systems Immunology. Ricardo Grieshaber-Bouyer studied medicine and business administration. He performed his clinical training in medicine, rheumatology and immunology at the Universities of Heidelberg and Zurich, at Duke University School of Medicine and at Harvard Medical School. His immunological research focuses on neutrophils, inflammatory arthritis and bioinformatics. After postdoctoral training with the Boston-based ImmGen Consortium, he then established a DFG-funded research group at Heidelberg University as clinician scientist, focusing on neutrophil heterogeneity in rheumatic disease. In October 2023, Ricardo Grieshaber-Bouyer joined FAU Erlangen-Nürnberg and the Department of Medicine 3 – Rheumatology and Immunology. In his clinical role, he heads the clinical trial unit and takes care of patients with rheumatic and immune-mediated diseases, in particular in the context of emerging therapies such as CAR-T cells. His research group investigates the mechanisms driving immune cell heterogeneity in tissues and inflammatory conditions and develops new bioinformatics analysis tools for high dimensional data.

We very much look forward to his participation in the FAU I-MED and future research highlights.

Prof. Dr. med. Klaus Überla

RTG 2504 succeeds in obtaining funding for a second period

In November 2023, the research training group RTG 2504 "Novel antiviral approaches" (speaker Prof. Dr. med. Klaus Überla, Director of the Institute of Clinical and Molecular Virology) received the good news on the approval of a 2nd funding period until 2028. The on-site review, which took place in June 2023, was very successful, with the reviewers being particularly satisfied with the excellent performance of the PhD and MD doctoral candidates. They also highlighted the collaboration with the Ragon Institute in Boston, pointed to the well-structured education concept with successful integration of medical doctoral students and valued the number of publications and graduations. Thanks to this funding, 15 new doctoral candidates in natural sciences (starting in 2025) and 12 doctoral candidates in medicine will be trained and hopefully obtain interesting results in the field of antiviral strategies.

We sincerely congratulate Klaus Überla and the RTG members on this success.

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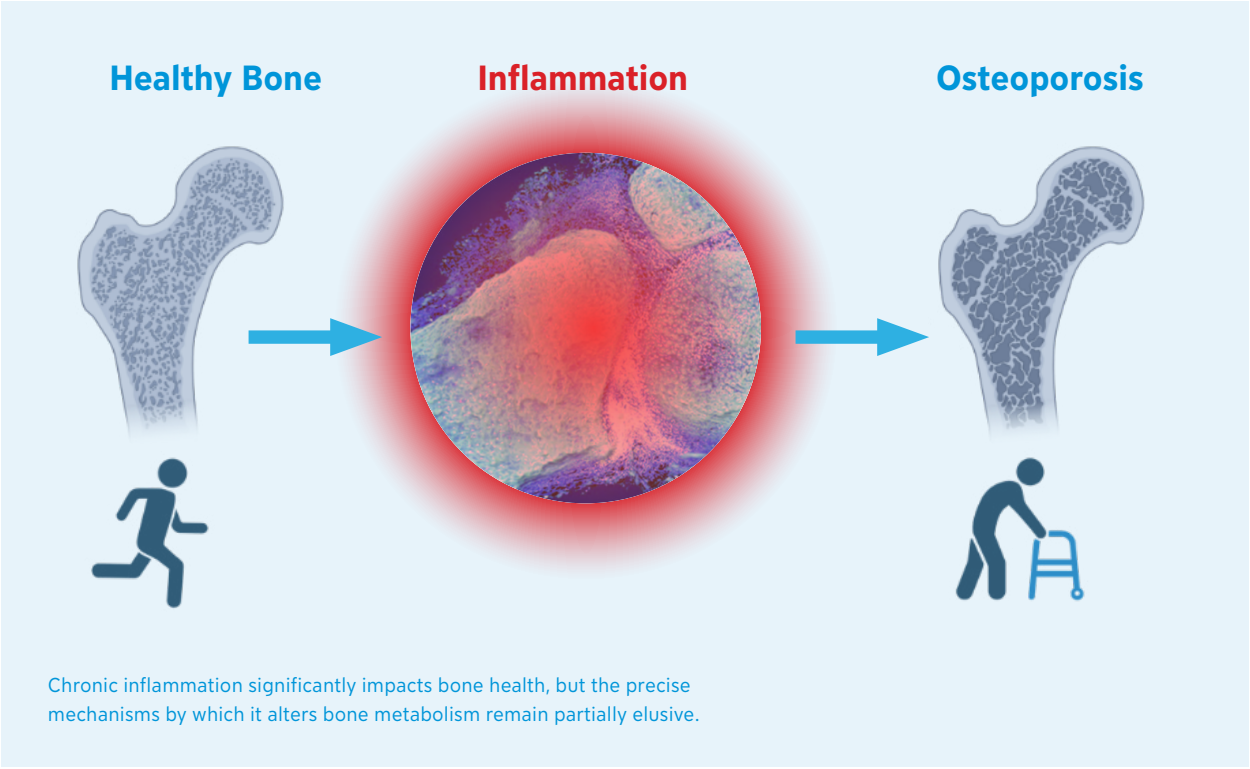
DFG funds the new Transregio-CRC 369 "DIONE – Degeneration of bone induced by inflammation"

The German Research Foundation (DFG) is funding a new research consortium, the Transregio-CRC 369 "DIONE – Degeneration of bone induced by inflammation", which is led by the Friedrich Alexander Universität Erlangen-Nürnberg (Spokesperson: Prof. Aline Bozec, PhD) in collaboration with the Technische Universität Dresden (Site spokesperson: Prof. Dr. rer. nat. Martina Rauner) and the Universität Ulm



Chronic inflammation significantly impacts bone health, but the precise mechanisms by which it alters bone metabolism remain partially elusive.

Chronic inflammatory diseases, like rheumatoid arthritis or inflammatory bowel disease, are not just confined to their specific target organs. They can also silently wreak havoc on our bones, increasing the risk of fractures and bone loss. This crucial connection, though widely observed, is insufficiently understood. DIONE aims to unravel the complex interplay between chronic inflammation and bone health. By integrating cutting-edge advancements in immunology and bone biology, researchers will investigate the regulatory mechanisms within and between cells that govern both inflammatory responses and skeletal reactions. Furthermore, they will explore the metabolic profiles of both the immune and skeletal systems, seeking insights into how inflammation disrupts bone health. This comprehensive approach will shed light on how specific inflammatory diseases, such as rheumatoid arthritis, psoriatic arthritis, inflammatory bowel disease or periodontitis, exert their bone-depleting effects. DIONE researchers hope to pave the way for novel therapeutic strategies that not only target the inflammatory disease itself but also protect and even rebuild weakened bones.

We cordially congratulate Aline Bozec on this funding and wish her much success with this new research consortium.

Dr. rer. nat. Natalie Thuma

New scientific manager of FAU I-MED

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Dr. rer. nat. Natalie Thuma studied biology at FAU and obtained her B.Sc. degree in 2014. In the same year, she started as a 'Fast Track'- PhD student within the research consortium on "Key signals of adaptive Immunity" (Research Training Group 1660). As part of her doctoral studies, she completed an internship abroad at the Malaghan Institute of Medical Research in Wellington, New Zealand, working with Prof. Graham Le Gros. Under the supervision of Prof. David Vöhringer (Department of Infection Biology) she completed her PhD, focusing on the antigen specificity of the adaptive immune response against helminths. In 2021, Natalie took up a position at the local State Health Authority (staatl. Gesundheitsamt) Erlangen-Höchstadt, where she contributed as deputy group leader and team leader of the contact tracing teams to the management of the coronavirus pandemic. Since 2024, she has been working at the Institute of Clinical Microbiology, Immunology and Hygiene as scientific manager of the new FAU Profile Center Immunomedicine (FAU I-MED).

We warmly welcome Natalie Thuma and very much look forward to her support of FAU I-MED.

Executive Board Members

Election of the new FAU I-MED executive board members and new department representatives

The founding meeting of FAU I-MED on November 29, 2023, led to the introduction of the new official statutes, which define novel thematic units of the Profile Center. The foundation of FAU I-MED also made elections of the new executive board (formerly coordination committee) necessary. Its members and responsibilities are listed below.

CHAIRMAN
Prof. Dr. med. Christian Bogdan
Director of the Institute of Microbiology – Clinical Microbiology, Immunology and Hygiene

DEPUTY CHAIRMAN
Prof. Dr. rer. nat. Aline Bozec
Department of Medicine 3 – Rheumatology and Immunology

DEPUTY CHAIRMAN
Prof. Dr. rer. nat. Falk Nimmerjahn
Director of the Institute of Genetics

REPRESENTATIVE FOR BASIC IMMUNOLOGICAL RESEARCH
Prof. Dr. rer. nat. Anja Lux
Chair of Genetics

REPRESENTATIVE FOR INFECTION IMMUNOLOGY
Prof. Dr. med. Klaus Überla
Director of the Institute of Clinical and Molecular Virology

REPRESENTATIVE FOR TUMOR IMMUNOLOGY
Prof. Dr. med. Andreas Mackensen
Director of the Department of Medicine 5 – Haematology and Oncology

REPRESENTATIVE FOR INFLAMMATORY DISEASES
Prof. Dr. rer. nat. Christoph Becker
Department of Medicine 1 – Gastroenterology, Pneumology and Endocrinology

REPRESENTATIVE FOR IMMUNOLOGICAL METHODS
Prof. Dr. rer. nat. David Vöhringer
Head of the Department of Infection Biology

REPRESENTATIVE FOR CLINICAL STUDIES ON IMMUNOTHERAPY
Prof. Dr. med. Georg Schett
Director of the Department of Medicine 3 – Rheumatology and Immunology

REPRESENTATIVE OF YOUNG SCIENTISTS
PD Dr. rer. nat. Ulrike Steffen
Department of Medicine 3 – Rheumatology and Immunology

Immunological Colloquium FAU I-MED

Summer 2024
Tuesdays, 05:15 pm

APRIL 16, 2024 • 12:30 pm
Prof. Francesca Ronchi
Institute of Microbiology, Infectious Diseases and Immunology (I-MIDI)
Charité – Universitätsmedizin Berlin

APRIL 23, 2024
Prof. Bettina Löffler
Institut für Medizinische Mikrobiologie, Universitätsklinikum Jena

APRIL 30, 2024 • 12:30 pm
Prof. Wolf-Dietrich Hardt
ETH Zürich, Institute of Microbiology

MAY 14, 2024
Dr. Nikolaus Dietlein
DKFZ Heidelberg

JUNE 4, 2024
Prof. Georg Schett
Department of Medicine 3 – Rheumatology and Immunology, Uniklinikum Erlangen

JUNE 11, 2024
JOACHIM KALDEN LECTURE
Prof. Carola Vinuesa
The Francis Crick Institute, London

JUNE 18, 2024
Prof. Frederik Graw
Department of Medicine 5 – Haematology and Oncology, Uniklinikum Erlangen

JUNE 25, 2024 • 12:30 pm
Prof. John Isaacs
Newcastle University, United Kingdom

JULY 2, 2024
Prof. Olivier Boyer
CHU Rouen Normandie

JULY 9, 2024
Prof. Chiara Romagnani
Charité - Universitätsmedizin Berlin

JULY 16, 2024
Dr. Claire Higgins
Imperial College, London

Conferences and Events of Interest

April – November 2024

APRIL 8–9, 2024
Jena, Germany
Annual Spring of the Paul Ehrlich Society for Anti-infectious Therapy

MAY 27–31, 2024
Porto, Portugal
ThymE 24: T Cell & Thymus Biology

JUNE 2–5, 2024
Würzburg, Germany
76th Annual Meeting of the German Society of Hygiene and Microbiology

JUNE 26 – 27, 2024
Regensburg, Germany
International LIT Symposium – "Synthetic Immunology/Synthetic Biology"

JULY 1–2, 2024
Berlin, Germany
From INNATE to ADAPTIVE Immunity – A question of memory

JULY 8–10, 2024
Egmond aan Zee, Netherlands
EBCnet 2024 – European B Cell Network

JULY 15–17, 2024
Cambridge, United Kingdom
ILC5 – 5th International Conference on Innate Lymphoid Cells

SEPTEMBER 1–4, 2024
Dublin, Ireland
ECI 2024 – 7th European Congress of Immunology

OCTOBER 7–12, 2024
Merseburg, Germany
Autumn School of the German Society of Immunology

NOVEMBER 8, 2024
Erlangen, Germany
Award ceremony for the Jakob Herz Price 2024

NOV 26–28, 2024
Vienna, Austria
37th Annual Meeting of the European Macrophage and Dendritic Cell Society (EMDS)

Profile Center Immunomedicine

Publisher

Profile Center Immunomedicine,

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Please note that the authors are responsible for the content of their contributions.

We are looking forward to suggestions for the next newsletter.
Please send material to:

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