

Annual Report
EMIH/IEM 2025

Environmental Medicine and Integrative Health (EMIH/IEM)
A Year of Integration, Translation, and Visibility

2025 marked a decisive transition year for EMIH/IEM: from parallel excellence in specialized domains toward a visibly integrated, translational research ecosystem. Across environmental immunology, metabolomics, microbiome science, exposure modeling, data science, and clinical infrastructure, a coherent narrative emerged: early environmental signals shape immune trajectories — and can be translated into prevention.



Group picture of the EMIH team and guests at the 3rd Augsburg Symposium „Breaking Barriers“, Michelle Neuhäuser

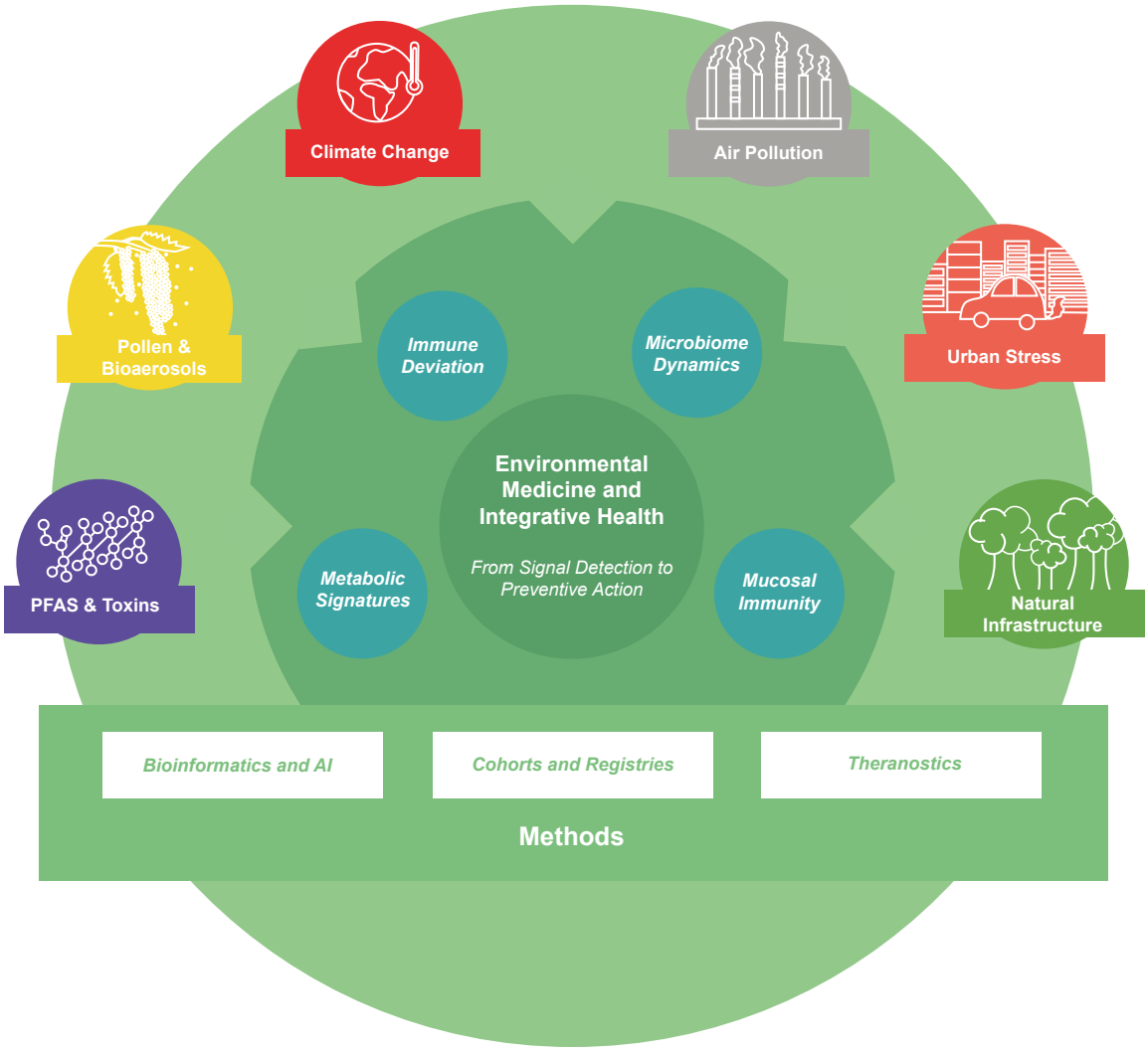
The Throughline of 2025: Integrative Medicine as the Conceptual Backbone of Translation

The throughline of 2025 was the transformation of environmental health research into structured, patient-centered implementation. Across all groups — from exposure science and immunology to microbiome analytics, metabolomics, and biomarker development — a shared direction became visible: understanding environmental signals is only the first step; translation into prevention is the goal.

With the structural launch of **Integrative Medicine**, EMIH established the clinical interface that serves as the conceptual backbone of this translation. Integrative Medicine functions as the operational bridge where environmental exposure data, immune biomarkers, microbiome signatures, and digital monitoring tools converge into personalized prevention strategies, stratified therapies, and resilience-oriented care pathways.

It is not just an additional layer to environmental medicine — it is its clinical realization. Laboratory discoveries now connect systematically with outpatient structures, registry platforms, digital health applications, and prevention programs.

In 2025, this integration became tangible. Environmental Medicine generated the signals. Integrative Medicine translated them into action.



Graphical Abstract EMIH 2025, Janina Müller

1. Establishment of the Professorship for Integrative Health Care and Prevention at the University of Augsburg (starting Nov 1, 2025)

The appointment of Prof. Dr. Christian Keßler to the Professorship for Integrative Health Care and Prevention at the Medical Faculty of the University of Augsburg as part of EMIH on 1st November 2025 marked an important step in establishing integrative medicine as a dedicated academic discipline within the university's clinical and research landscape. The professorship will conduct scientific evaluations of the effectiveness and facilitate evidence-informed integration of complementary and integrative medicine approaches into contemporary health care systems. To achieve this, clinical care structures at the University Hospital Augsburg will be established expanding the scope of the existing Outpatient Clinic for Environmental Health under the leadership of Prof. Claudia Traidl-Hoffmann as director and Prof. Christian Keßler as medical director.

The research agenda focuses on several interconnected domains, including integrative medicine and clinical TCIM, traditional medical systems from Europe and Asia, mind-body medicine, and preventive health strategies. A key methodological principle is the combination of mixed-methods clinical research with modern laboratory analytics, biomarker research, and bioinformatics approaches in order to generate robust scientific evidence for the integration of complementary treatment strategies into routine medical care.



Prof. Dr. med. Christian Keßler, Samuel Tschaffon

"Integrative Medicine is a lived reality in European societies and a frequent patient need, including at university hospitals. This is now being addressed by providing evidence-based complementary medicine care and research concepts at Augsburg University Hospital."

Prof. Dr. med. Christian Keßler, Professor of Integrative Health and Prevention

2. Understanding Environmental Drivers of Disease

Our work in **Environmental Immunology** demonstrated how biogenic exposures such as pollen modify antiviral responses of nasal epithelial cells, increasing viral replication and shedding. These findings position bioaerosols not merely as allergy triggers but as modulators of infectious disease transmission. Parellel human biomonitoring in small, well-characterised cohorts of allergic rhinitis patients and healthy controls are being conducted to analyse exposure-response-relationships, air quality thresholds for symptoms and symptom season predictions. Large-scale analyses on health insurance data help to determine environmental and societal triggers of allergic airway diseases like asthma and rhinitis.

In **Human Exposure Science**, AI-supported pollen and fungal spore monitoring, fine-scale allergenicity mapping, and multi-scale meteorological modeling converged into clinically actionable exposure forecasts. Parallel large-scale analyses connected climate change, temperature extremes, aeroallergens, and respiratory morbidity, showing that heat and cold significantly increase emergency visits — with warming trends amplifying risk. The acquisition of MEDICUS (BayKlif2) strengthened the climate–health–urban transformation axis, while long-term regional analyses firmly linked environmental change to respiratory burden.

Together, these findings reinforce a central insight: **climate and bioaerosol dynamics are already reshaping respiratory and allergic disease patterns.**



"My highlight of 2025: Pollen exposure prior to coronavirus infection alters the antiviral response of nasal epithelial cells, resulting in widespread viral gene transcription and increased shedding of infectious particles. Our results highlight the significance of biogenic co-exposures as modifiers of respiratory virus transmission."

PD Dr. Stefanie Gilles, Research Group Leader Environmental Immunology



"My highlight of 2025 was the growing visibility of our work through publications, scientific recognition, and collaborative projects which reflects the strength and coherence of our research as a team and how individual efforts are forming a coherent and impactful research direction that translates into clinical relevance and public engagement."

María Pilar Plaza Garcia, Ph.D., Research Group Leader Human Exposure Science

3. Microbiome Science Moves Toward Clinical Utility

Across **Functional Microbiomics, Environmental Bioinformatics**, and **Integrative Data Science**, 2025 was characterized by methodological consolidation and translational breakthroughs.

A novel computational method to correct extraction bias in microbiome sequencing (published in *Microbiome*) addressed a major field-wide limitation, enhancing reliability and comparability of microbiome studies. Parallel analyses in atopic dermatitis demonstrated that systemic therapy (e.g., dupilumab) reduces *Staphylococcus aureus* abundance and that microbiome signatures can serve as biomarkers for treatment prediction.

Strategically, our teams harmonized pipelines (MicrobIEM, AnnotIEM), validated computational tools with culture and qPCR data, and initiated cross-project data integration workshops. The result is a standardized microbiome-to-clinic pipeline capable of supporting biomarker development in dermatology and respiratory medicine.

The guiding question became sharper:
How can microbiome signals be transformed into robust, clinically actionable diagnostics?



"My highlight of 2025 was to return from maternal leave and see the progress and success of all team members looking at conference participations, lab work, preparation of publications and personal development. Personally, I learned a lot in the Helmholz Führungskräfte Workshop, which was enlightening."

Dr. Claudia Hülpüsch, Research Group Leader Functional Microbiomics



„My highlight of 2025: In my talk at the Workshop on Viral Dynamics, Bordeaux (October 2025), it became clear that for microbiome dynamics to be clinically relevant we must standardize the pipeline for quantitative longitudinal analysis of the microbial signatures."

Prof. Dr. Avidan Neumann, Research Group Leader Environmental Bioinformatics



„My highlight of 2025 was starting my own research group and collaborating with EMIH colleagues from other groups to organize a joint workshop in which we defined strategies for addressing the key future challenges in microbiome research."

Dr. Luise Rauer, Research Group Leader Integrative Data Science

4. Immune Biomarkers and Rapid Diagnostics

The **Immune Biomarker** group advanced a translational pipeline from mucosal immune marker discovery to assay development and rapid-test concepts. Although a patent application for nasal IgE testing was not supported, the outcome enabled strategic freedom to operate and accelerate scientific implementation.

Single-cell analysis was initiated, mass spectrometry expanded, and multiple competitive international grants were submitted (EU Horizon, SNF, TÜBİTAK, foundations).

The strategic focus shifted toward reusing and harmonizing EMIH's existing datasets to identify scalable, non-invasive biomarkers suitable for early detection and population-based application.

The emphasis is clear:
Prevention requires early immune detection — feasible, non-invasive, and scalable.



"My highlight of 2025: It was a year of teaching marked by several milestones: hosting several guest scientists, supervising Erasmus students and interns, and celebrating the successful defense of a PhD student. In addition, we completed our first mass spectrometry analysis and initiated single-cell analysis by placing the order."

Dr. rer. nat. Mehmet Gökkaya, PhD, Research Group Leader Immune Biomarker



Visit at the Ege University Hospital in İzmir, funded by the TÜBİTAK grant, Mehmet Gökkaya

5. Environmental Metabolomics and PFAS: Building Analytical Sovereignty

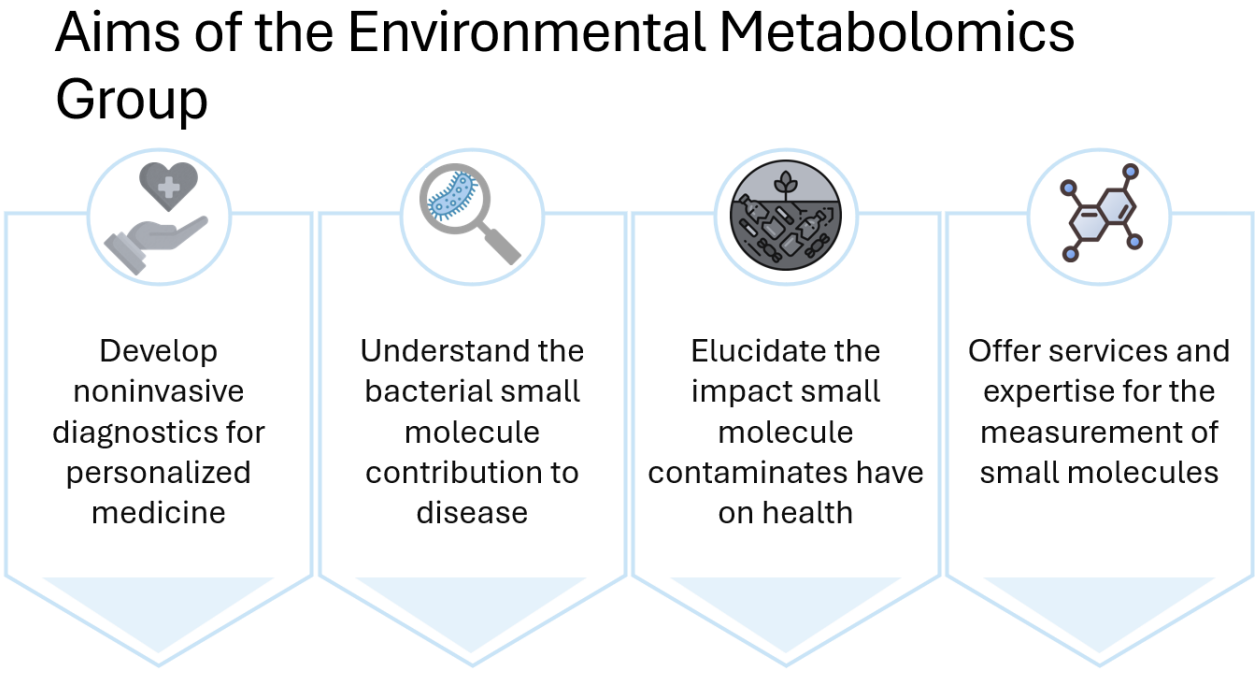
In 2025, the **Environmental Metabolomics** group established a sensitive PFAS panel capable of detecting very low environmental concentrations. Two major projects (HOPE and BoReF) were awarded, positioning EMIH at the interface of environmental contamination, immune development, and remediation science.

Simultaneously, oxidized fatty acid panels and microbiome-metabolome studies in skin diseases strengthened the metabolic dimension of immune-environment interactions. Standardization efforts aim to achieve analytical lab certification, enhancing both scientific rigor and translational credibility.



„My highlight of 2025 was when Luis determined that there was a higher presence of bacteria on the vocal cords of those with head and neck cancer. Another highlight moment that will define the group for the upcoming years was the establishment of a PFAS panel where we confirmed we have the capabilities to measure very low quantities of PFAS in a sensitive manner.“

Dr. Jamie Afghani, Research Group Leader Environmental Metabolomics



Aims of the Environmental Metabolomics Group, Dr. Jamie Afghani

6. Clinical Integration and Study Infrastructure

The **Study Center and Outpatient Clinic** intensified integration between registry structures (REFORME), biomarker research (IMPROVE), and biobank networking. Acceptance into the Bavarian Alliance for Prevention represents strategic recognition of EMIH's preventive mission.

Clinical cohorts now increasingly serve as translational anchors connecting exposure, microbiome, immune markers, and real-world patient outcomes.

„One of my highlights this year was being accepted into the Bavarian Alliance for Prevention by the Bavarian State Ministry of Health, Care, and Prevention."
Monika Seemann, Head of HR Strategy and Operations, Head of Study Centre

7. Core Facility Flow Cytometry

The Core Facility Flow Cytometry has increased its significance as supportive unit for the research at the Medical Faculty of Augsburg. Regular meetings with the faculty led to significant progress in harmonizing processes and schedules, facilitating analyses. User numbers increased.

A hands-on workshop was also well attended and generated strong interest for the coming year, including potential expansions and additions to the equipment.



Device for cell analysis „Navios", Janina Müller



"The highlight of the year was the initiation of regular meetings with the medical faculty to address the future of the core facilities, which resulted in concrete and substantial progress."
Nicole Pochert, Technical Leader Flow Cytometry Core Facility

8. Science Communication and Societal Reach

With approximately 75 media engagements, ARD documentary coverage, national press features, and growing digital visibility, 2025 marked an expansion in public engagement. Events such as the "Heat Action Day" and the 3rd Augsburg Symposium "Breaking Barriers" connected environmental research directly with public health discourse.

Science communication evolved from dissemination toward strategic positioning:
EMIH as a bridge between environmental change, immune biology, and prevention.



Television shoot for ARD Spurensuche, Melanie Pawlitzki



"My highlight of 2025 is that creativity grew this year within our team – we had a lot of high-profile journalists, film teams, photographers working with us, among them Daniel Biskup and Lena Ganschow and her team from ARD – it was a pleasure and very inspiring!"

Dr. Melanie Pawlitzki, Scientific Writer, Media and Communication



Talk of Prof. Dr. med. Claudia Traidl-Hoffmann during the 3rd Augsburg Symposium "Breaking Barriers", Samuel Tschaffon



9. A Coherent Strategic Trajectory

Across all groups, 2025 revealed a structural shift:

- From isolated datasets to harmonized pipelines
- From descriptive associations to predictive biomarkers
- From environmental measurement to preventive strategies
- From methodological innovation to clinical implementation

The integration of exposome research, microbiome analytics, immune biomarkers, metabolomics, and clinical registries positions EMIH as a **trailblazer in climate-resilient preventive medicine.**

As we move toward the 2026 opening phase, EMIH stands on a consolidated foundation:

Environmental signals are detectable.
Immune deviations are measurable.
Translation into prevention is achievable.

2025 was the year this vision became operational.



2026 and Beyond: Scaling Translation and Building Preventive Systems

If 2025 was the year of structural integration, 2026 must become the year of scaling and systematization.

The next step is to move from proof-of-concept translation to structured preventive pathways. This means:

- Embedding immune and microbiome biomarkers into prospective clinical algorithms
- Expanding exposure-informed early warning systems (heat, pollen, bioaerosols) into routine care
- Integrating environmental risk profiles into stratified outpatient management
- Linking registries, biobanks, and digital tools into a coherent predictive infrastructure

Integrative Medicine will increasingly function as a **living laboratory for prevention**, where environmental data, clinical phenotyping, and patient-reported outcomes interact in real time. The goal is not only improved treatment, but earlier intervention — ideally before chronic disease trajectories consolidate.

Strategically, 2026 offers three major development axes:

1. **Deepening Climate–Health Translation**
   Expanding climate resilience research into practical care models and policy-relevant frameworks.
2. **Standardization and Certification**
   Strengthening laboratory accreditation, harmonizing microbiome and biomarker pipelines, and positioning EMIH as a reference center for environmental diagnostics.
3. **Scaling Cohorts and Data Integration**
   Leveraging existing EMIH datasets for predictive modeling while building new prospective, city-wide and multi-center cohorts.

The overarching ambition remains clear:
To shift from reactive medicine to predictive and preventive systems that respond to environmental change with scientific precision and societal responsibility.

In this sense, 2026 is not simply a continuation — it is the next maturation step of EMIH's identity as a trailblazer in climate-resilient, integrative preventive medicine.

Awards and Prizes

Prizes

Breaking Barriers Symposium Augsburg (3. Augsburger Neurodermitis Symposium):
Berkay Berk – Poster Prize
Stefanie Gilles – Poster Prize
Avidan Neumann – Outstanding Oral Presentation
Maria P. Plaza – Poster Abstract Prize
Anna Reiter – Outstanding Poster Presentation
Swetlana Urban – Poster Prize

CASSINI Challenge 2024, EUSPA - Prototype Track:
Maria P. Plaza, Matthias Reiger, Claudia Hülpüsch, Nicole Engelbert, Claudia Traidl-Hoffmann – Prototype track Winners for Project Aden



CASSINI entrepreneurship days 2025,
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EAACI Allergy School 2025:
Mehmet Gökkaya – Outstanding Poster Presentation Award

EAACI Congress 2025 „Breaking boundaries in Allergy, Asthma, and Clinical Immunology: Integrating Planetary Health for a Sustainable Future“ in Glasgow, Scotland:
Maria P. Plaza – Oral Abstract Prize
Avidan Neumann – Outstanding Oral Abstract Presentation Award

Helmholtz Munich, High Potentials Program 2023-2025:
Dr. Mehmet Gökkaya – TÜBITAK sabbatical grant - The Scientific and Technological Research Council of Turkey

Kanert-Preis für Allergieforschung 2025:
Dr. Matthias Reiger

Wissenschaftstag 2025 in Universitätsklinikum Augsburg:
Carolin Trost – Poster Prize
Robin Rohayem – Outstanding MD Thesis

Completed Theses

Our students and early-career scientists have completed work in various disciplines that significantly contribute to environmental medicine and health research.

Bachelor Theses

- **Michael Oster:** *Einfluss von Pollenexposition auf die Suszeptibilität von differenzierten Nasenepithel-Zellkulturen mit dem humanen Coronavirus 229E*, Submitted: September 2025, Research Group: Environmental Immunology

Master Theses

- **Isabel Auer:** *Abschätzung des Einflusses von Temperatur und Pollen auf die Gesundheit der Atemwege unter Einbeziehung von Social-Media-Daten in Zeiten des Klimawandels*, Submitted: November 2025, Research Group: Human Exposure Science
- **Nihan Özcan:** *Impact of Nutritional Fatty Acid Profiles on COVID-19 Disease Severity and Inflammation: A LC/MS Approach*, Submitted: September 2025, Research Group: Immune Biomarker, Environmental Metabolomics

Dissertations (Dr. med., MD, PhD)

- **Corinna Holetschek (PhD)**: *The association of immune kinetics and biomarkers with COVID-19 severity*, Submitted: September 2025, Research Group: Environmental Bioinformatics
- **Johannes Karg (MD)**: *Symptomschwere, Rhinitis-bezogene Lebensqualität sowie expositionsrelevantes Verhalten bei Gräserpollenallergikern in einer Allergie-App-Studie*, Defended with "magna cum laude": May 2025, Research Group: Environmental Immunology
- **Katharina Zeiser (Dr. phil.)**: *Gesundheit und Stress in der späten Moderne. Eine Mixed Methods Untersuchung am Beispiel von Neurodermitis im Erwachsenenalter*, Submitted: Dezember 2025, Second Supervisor: Frau Prof. Traidl-Hoffmann

We congratulate all graduates on their academic success!

Internships

- **Selin Candan (Research Internship External)**: *Microbiome Dynamics and their Impact on Inflammation*, April to May 2025, Research Group: Immune Biomarker
- **Ayse Zeynep Cebeci (Erasmus+ Student Mobility for Traineeship program)**: *COVID-19: Cluster analysis on psychosocial questionnaire*, August to September 2025, Research Group: Immune Biomarker
- **Nagihan Emeksiz (Erasmus Internship)**: *Internship in Cell Culture Laboratory*, June to July 2025, Research Group: Environmental Immunology
- **Luis Hartmann**: *Microbiome of Laryngeal Cancer qPCR analysis of vocal cord swabs versus controls,* September 2024 to July 2025, Research Group: Environmental Metabolomics
- **Antonia Schmidt**: *In search of true diversity representation: Analysis of alpha diversity indices in simulated data,* May to July 2025, Research Group: Integrative Data Science
- **Michael Oster:** June to July 2025, Research Group: Environmental Immunology

Events

Anpfiff für die Haut, October 9: Scarlet Möckel, Ferdinand Möckel, Daria Luschkova
Breaking Barriers Symposium Augsburg (3. Augsburger Neurodermitis Symposium), February 25-26, EMIH
Hitzeaktionstag UKA, June 4 Matteo Boser, Carolin Trost, Antonia Schmidt
Münchner Wissenschaftstage, Forscha Munich, October 10-12: Vivien Leier-Wirtz, Claudia Khalfi, Maria P. Plaza, Claudia Ranieri

Teaching

CREDA groups, April 28, May 22, January 07, January 27, October 13, October 16, December 18, Nicole Engelbert and Ferdinand Möckel
Hands-on Workshop Durchflusszytometrie, May 14-15, Nicole Pochert
OL Allergien & Umwelt, Summer Semester 2025, Dr. Stefanie Gilles
Seminar Allergie, April 29, July 15 and July 16, Dr. Stefanie Gilles and Robin Rohayem
Seminar Fallbeispiele, May 09, July 24, Dr. Alika Ludwig und Daria Luschkova
UaP "Atopie", April to May 2025, organized by Dr. Stefanie Gilles and Maria Plaza
UaP „Umweltfaktoren", April 24 to July 23, doctors from the Outpatient Clinic, lead Nicole Engelbert
Wahlfach "Klimawandel & Gesundheit" at UFS Schneefernerhaus, August 19-22, organized by Dr. Luise Rauer, Dr. Maria Plaza, Daria Luschkova, Nicole Engelbert, Matteo Boser
Wissenschaftliches Blockpraktikum FS 5/6, July 07-18, organized by Dr. Stefanie Gilles and with contributions from Dr. Jamie Afghani, Berkay Berk, Annika Eggestein, Anja Fusco, Dr. Mehmet Gökkaya, Dr. Corinna Holetschek, Lena Klepper, Vivien Leier-Wirtz, Aline Metz, Dr. Maria Plaza, Nicole Pochert, Dr. Luise Rauer, Dr. Matthias Reiger, Carolin Trost, Swetlana Urban, Dr. Stefanie Gilles
Wissenschaftliches Blockpraktikum 8, May 26-27 and June 02-04, Dr. Luise Rauer, Topic: *Statistics – Data visualisation – Coding* (course together with Dr. Corinna Holetschek)



Cooperations Partners

Aarhus University, Aarhus, Denmark
Aristotle Universtity of Thessaloniki, Thessaloniki, Greece
Austrian Institute of Technology, Tulln, Austria
Bayerisches Staatsministerium für Gesundheit, Pflege und Prävention, Munich/Nuremberg, Germany
Belgian Institute for Health, Brussels, Belgium
BioMap consortium (IMI), Summerville, USA
Biederstein Klinik und Poliklinik für Dermatologie und Allergologie der TUM, Munich, Germany
Charité - Universitätsmedizin Berlin, Allergieforschung, Berlin, Germany
Charité - Universitätsmedizin Berlin, Pädiatrie und Integrative Medizin, Berlin, Germany
CK-CARE - Christine Kühne Center for Allergy Research and Education, Davos, Switzerland
Deutscher Allergie- und Asthmabund e.V., Mönchengladbach, Germany
EGE University (EgeSAM) Translational Pulmonology Research Center, İzmir, Türkiye
Finnish Meteorological Institute, Helsinki, Finland
Fondazione Edmund Mach, San Michele All'Adige, Italy
Harvard T.H. Chan School of Public Health, Environmental Health, Boston, USA
Helmholtz Klima, Berlin, Germany
Helmholtz Munich und TUM, Comparative Microbiome Analysis and Umweltmikrobiologie, Neuherberg/Munich, Germany
HMGU IEM Institute of Allergy Research, Augsburg, Germany
HMGU IEM Institute of Environmental Medicine, Augsburg, Germany
Helmholtz Munich, Institute of Epidemiology, Neuherberg/Munich, Germany
Helmholtz Munich and TUM, Institute of Virology, Neuherberg/Munich, Germany
Helmholtz Munich, Analytical Biogeochemistry, Neuherberg/Munich, Germany
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Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany
Istituto Dermopatico dell'Immacolata, Rom, Italy
Julitta & Richard Müller Stiftung, Munich, Germany
Karlsruher Institut für Technologie, Karlsruhe, Germany
King's College London, Paediatric & Population-Based Dermatology Research, London, UK
KVB - Kassenärztliche Vereinigung Bayerns, Munich, Germany
La Roche Posay, Clichy, France
Leiden University Medical Centre, Leiden, Netherlands
LMU München, Klinik und Poliklinik für Dermatologie und Allergologie, Munich, Germany
L'Oréal, Clichy, France
Medizinische Hochschule Hannover, Hannover, Germany
Medizinische Universität Wien, Vienna, Austria
MeteoSchweiz - Bundesamt für Meteorologie und Klimatologie Schweiz, Zurich, Switzerland
MRI TUM Universitätsklinikum, Strahlentherapie, Munich, Germany
National Center for Public Health and Pharmacy, Budapest, Hungary
National Pirogov Memorial Medical University, Vinnytsia, Ukraine
National University of Ireland, Department of Medicine and School of Microbiology, Cork, Ireland

NIA Health, Berlin, Germany
Novartis, Basel, Switzerland
Paris Lodron University of Salzburg, Salzburg, Austria
Perelman School of Medicine, University of Pennsylvania, Philadelphia, USA
PID - Stiftung Deutscher Polleninformationsdienst, Berlin, Germany
Potsdam-Institut für Klimafolgenforschung, Potsdam, Germany
Ostschweizer Kinderspital St. Gallen, St. Gallen, Switzerland
Queensland University of Technology, Brisbane, Australia
Sanofi, Paris, France
Sciensano - Belgium Institute for Health, Brussels, Belgium
SIAF - Swiss Institute of Allergy and Asthma Research, Davos, Switzerland
Sorbonne University's Faculty of Medicine at the Pitié-Salpêtrière site in Paris, Centre for Immunology and Microbial Infections (Cimi), Paris, France
Swedish Museum of Natural History, Stockholm, Sweden
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Technical University of Munich, Munich, Germany
The University of Manchester, Manchester, UK
Transylvania University, Faculty of Medicine, Brasov, Romania
TUM - Von Haunersches Kinderspital, Munich, Germany
TUM School of Life Sciences, Munich, Germany
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Universität Freiburg, Dermatologie und Venerologie, Freiburg, Germany
Universitätsspital Zürich, Dermatologie, Zurich, Switzerland
University of Castilla-La Mancha, Ciudad Real, Spain
University of Copenhagen, Copenhagen, Denmark
University of Cordoba, Department of Botany, Ecology and Plant Physiology, Córdoba, Spain
University of Evora, Evora, Portugal
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University of Helsiniki, Systems Immunology, Helsinki, Finland
University of Helsinki, Department of Physics Mathematical modelling of atmospheric composition, Helsinki, Finland
University of Malaga, Department of Botany and Plant Physiology, Malaga, Spain
University of Pennsylvania Perelman School of Medicine, Department of Microbiology, Philadelphia, USA
University of Porto, Porto, Portugal
University of Szeged, Faculty of Agriculture, Szeged, Hungary
University of Tirana, Tirana, Albania
Vilnius University, Vilnius, Lithuania
WIdO - wissenschaftliches Institut der AOK, Qualitäts- und Versorgungsforschung, Berlin, Germany
Wissenschaftszentrum Umwelt, Augsburg, Germany
Wrocław Medical University, Department of Clinical Immunology, Wroclaw, Poland
ZAUM - Zentrum für Allergie und Umwelt TUM, Munich, Germany
Zentrum für Interdisziplinäre Gesundheitsforschung, Augsburg, Germany
Zentrum für Klimaresilienz, Augsburg, Germany

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