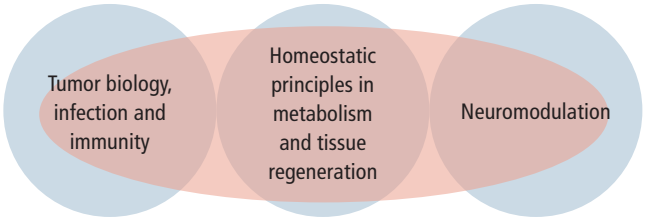
NETWORK OF EXCELLENCE – THE RESEARCH



About 1900 scientists of over 55 medical clinics, institutes and research centers work at the Faculty of Medicine, University of Cologne.
The research activities are concentrated on the molecular analysis of disease mechanisms. Therefore the Medical Faculty developed structures for an efficient translation of research into patient care, focusing on well-defined research areas hereby constructing scientific networks.

The overarching theme of the three Focus Areas is Aging and Demographic Change:

- **Tumor biology, infection and immunity**
- **Homeostatic principles in metabolism and tissue regeneration**
- **Neuromodulation**

Close cooperation and the proximity to the Cluster of Excellence in Cellular Stress Responses in Aging-Associated Diseases (CECAD), the Center for Molecular Medicine Cologne (CMMC) and the Center for Clinical Studies (CCS) achieve strong synergies in research.

More details to the research foci to be found here:

CONTACT PRINCIPLE INVESTIGATORS

Research Focus Area: Tumor biology, infection and immunity
Coordinator: Prof. Michael Hallek
E-Mail: michael.hallek@uk-koeln.de

Deputy Coordinator: Prof. Martin Krönke
Phone: +49 221 478 32000
E-Mail: martin.kroenke@uk-koeln.de

Research Focus Area: Homeostatic principles in metabolism and tissue regeneration
Coordinator: Prof. Carien Niessen
Phone.: +49 221 478 89512
E-Mail: carien.niessen@uni-koeln.de

Deputy Coordinator: Prof. Jens Brüning
Phone: +49 221 4726 202
E-Mail: bruening@nf.mpg.de

Research Focus Area: Neuromodulation
Coordinator: Prof. Gereon Fink
Phone.: +49 221 478 4000
E-Mail: gereon.fink@uk-koeln.de

CECAD Research Center
Scientific Coordinator: Prof. Jens Brüning
Phone: +49 221 4726 202
E-Mail: bruening@nf.mpg.de

Acting Director: Prof. Björn Schumacher
Phone: +49 221 478 84202
E-Mail: bjoern.schumacher@uni-koeln.de

Center for Molecular Medicine Cologne
Chair: Prof. Thomas Benzing
Phone: +49 221 478 4480
E-Mail: thomas.benzing@uk-koeln.de

Gestaltung: Debora Schiffer, Abteilung Marketing | Fotos: MedizinFotoKöln

UNIVERSITY OF COLOGNE
FACULTY OF MEDICINE
RESEARCH FOCI

University of Cologne
Faculty of Medicine

TUMOR BIOLOGY, INFECTION AND IMMUNITY

This research focus comprises two strongly overlapping areas.
The area "Tumor and Defense" focuses on:

- Understanding of the molecular mechanisms of tumor development and immune response
- Development of personalized therapies adapted to the individual genetic profile of the patient
- Optimization of treatment regimes for patients

The area "Infection and Defense" focuses on:

- The range from basic research to translational and clinic research
- The molecular analysis of the immune system defense against pathogens

The specific scientific focus is on:

- Hematological malignancies, Hodgkin lymphoma, hereditary colon cancer as well as solid tumors
- Vaccination against MRSA based on the generation and application of antibody molecules supporting the immune system

HOMEOSTATIC PRINCIPLES IN METABOLISM AND TISSUE REGENERATION

The aim of the research focus is:

- Defining the molecular signalling pathways and the cellular interactions that regulate metabolic processes and tissue homeostasis
- Characterizing how disruptions of these signalling pathways lead to ageing-related metabolic and degenerative diseases

The area focuses on developing therapeutic strategies for:

- Diseases associated with metabolic changes, such as diabetes
- Degenerative disorders such as renal fibrosis
- Skin diseases, including wound-healing disorders

The specific scientific focus is on:

- Understanding molecular mechanisms underlying metabolic disorders, for example, type 2 diabetes mellitus.
- Understanding the molecular and cellular relationships between metabolic syndromes and their associated diseases
- Identifying molecular and cellular interactions in tissues that are required for the regeneration and restoration of tissue homeostasis after injury

NEUROMODULATION

The aim of this research focus is:

- Gaining deeper insight in normal and disturbed functions of neural networks
- Better understanding neurological and psychiatric disease and recognize them earlier
- Developing specific therapeutic approaches to neuromodulation

The specific scientific focus is on:

- Enlightenment of the functions of Basal Ganglia Cortex Loops (BGCL)
- Identification of the mechanisms of pathological interactions in the BGCL
- Development of targeted methods for normalizing the networks, particularly using deep brain stimulation
- Work on disruptive effects of strokes and the application of neuromodulatory procedures
- Promotion of cerebral plasticity and recovery of function after a stroke