

Director of the Research Center

Prof. Dr. med. Georg Schett

**Institution**

Department of Internal Medicine 3 and
Institute for Clinical Immunology
Krankenhausstr. 12
D-91054 Erlangen
Tel. +49-9131-853-3418
Fax. +49-9131-853-4770
georg.schett@uk-erlangen.de

Members of the Center***Clinical Unit***

Bernhard Manger, MD, Professor
Thomas Harrer, MD, Professor
Reinhard Voll, MD, Professor
Christoph Bleh, MD
Jürgen Rech, MD
Jörg Distler, MD
Christian Beyer, MD
Tobias Braun, MD
Stephanie Finzel, MD
Ellen Harrer, MD
Arndt Kleyer,
Gerhard Krönke, MD
Veronika Lang, MD
Annja Reisch, MD
Monika Ronneberger, MD
Enijad Sahinbegovic, MD
Valentin Schäfer, MD
Stefan Uderhardt, MD
Jochen Wacker, MD
Jochen Zwerina, MD

bernhard.manger@uk-erlangen.de
thomas.harrer@uk-erlangen.de
rvoll@molmed.uni-erlangen.de
christoph.bleh@uk-erlangen.de
juergen.rech@uk-erlangen.de
joerg.distler@uk-erlangen.de
christian.beyer@uk-erlangen.de
tobias.braun@uk-erlangen.de
stephanie.finzel@uk-erlangen.de
Ellen.harrer@uk-erlangen.de
arnd.kleyer@uk-erlangen.de
gerhard.kroenke@uk-erlangen.de
veronika.lang@uk-erlangen.de
annja.reisch@uk-erlangen.de
monika.ronneberger@uk-erlangen.de
enijad.sahinbegovic@uk-erlangen.de
valentin.schaefer@uk-erlangen.de
stefan.uderhardt@uk-erlangen.de
jochen.wacker@uk-erlangen.de
jochen.zwerina@uk-erlangen.de

Research Unit

Hans-Martin Jäck, Professor
Martin Herrmann, PhD, Professor
Jean-Pierre David, PhD
Michael Stock, Dr. rer. nat.
Dirk Mielenz, PhD
Wolfgang Schuh, PhD

hjaeck@molmed.uni-erlangen.de
martin.herrmann@uk-erlangen.de
jean-pierre.david@uk-erlangen.de
mstock@molmed.uni-erlangen.de
dmielenz@molmed.uni-erlangen.de
wschuh@molmed.uni-erlangen.de

Current Fields of Research

Basic, translational and clinical research to discover the molecular and cellular pathogenesis of rheumatic and autoimmune diseases. The clinic is dedicated to investigate novel molecular and cellular targets in diseases like inflammatory arthritis, osteoarthritis and connective tissue disorders.

In detail the following research topics are covered:

Osteoimmunology: description of the interaction between immune activation and chronic inflammation with bone loss. This topic addresses the molecular and cellular regulation of bone resorption and bone formation which is relevant to chronic inflammatory diseases particularly rheumatoid arthritis and ankylosing spondylitis. Basic translational and clinical investigations are carried out regarding this topic.

Pathogenesis of SLE:

The department aims to understand the mechanisms of immune response against intercellular antigens in SLE, particularly in the role of deregulation of the innate immune system in triggering the formation of autoantibody responses. Mechanisms linking cell death, particularly apoptosis to autoimmunity are investigated.

Pathogenesis of arthritis

We define novel pathways in the pathogenesis of rheumatoid arthritis, psoriatic arthritis and ankylosing spondylitis in order to define common principles of joint inflammation. Cytokine effects as well as intracellular signalling pathways are studied in their contribution to onset maintenance and resolution of inflammation.

Humoral immune response

The objective is to understand the molecular circuits that control early B cell maturation, the establishment of the antibody repertoire and the antigen-dependent differentiation of antibody-secreting plasma cells. In particular, the studies address in transgenic mouse models the molecular function of immature Ig receptors, microRNAs and transcription factors such as KLF2, Blimp1 and IRF4 in the maturation and selection of functional B lymphocytes.

Mechanisms of fibrosis

Understanding the mechanisms of fibrosis is of key importance for the understanding of diseases like systemic sclerosis, but also other forms of tissue fibrosis such as in consequence of inflammatory disease. Characterization of the molecules leading to fibroblast activation and connective tissue deposition are a central part of research in our department.

Selected Publications

1. Hess, A., Axmann, R., Rech, J., Finzel, S., Heindl, C., Kreitz, S., Sergeeva, M., Saake, M., Garcia, M., Kollias, G., Straub, R. H., Sporns, O., Doerfler, A., Brune, K., and Schett, G.. Blockade of TNF- α rapidly inhibits pain responses in the central nervous system. *PNAS* 2011, in press.
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WebPages

<http://www.med3.med.uni-erlangen.de>
<http://www.molmed.uni-erlangen.de>