Peripheral Nerve Group

Head: Priv.-Doz. Dr. Helmar C. Lehmann, MD
phone: +49 221 478-87091
fax: +49 221 478-87309
E-Mail: helmar.lehmann@uk-koeln.de

Team:

Ija Bobylev, Dipl.Biol.
Claudia Drapatz, BTA
Abhijeet Joshi, M.S. (Pharm.) Biotechnology
Ines Klein, Dipl.Biol.
Dr. Maryam Balke, M.D.
Dr. Christian Ritter, M.D.
Christian Schneider, M.D.
Dr. Christoph Seifert, M.D.
Helina Maru, cand. med.
Alina Sprenger, cand. med.
Martin Svacina, cand. med.

Lab:

LFI Ebene 5
Room 406/7
Phone: +49 221 478-89144/5
Fax: +49 221 478-89143

CMMC
Raum 5.033
CMMC-research building (Geb. 66)
Telefon: +49 221 478-89144/5
Telefax: +49 221 478-89143

Our group is focusing on the pathogenesis and therapeutic approaches of diseases of the peripheral nervous system. Peripheral nerve disorders encompass a spectrum of heterogeneous disorders of inflammatory, toxic, hereditary or metabolic origin. Polyneuropathies are highly prevalent: At the age of 55 years, around 5-8 percent of all people suffering of symptomatic peripheral neuropathy, whereas in the age group above 65 years, almost one third of all people are estimated to be affected by peripheral neuropathy.
Moreover, polyneuropathy is the most common neurological sequelae in many systemic disorders such as diabetes, HIV infection, leukemia and other oncological diseases.

**Research areas:**

**Immune neuropathies**

Immune neuropathies are acute or chronic immune-mediated inflammatory neuropathies, which can be distinguished by clinical symptoms, electrophysiology and autoantibody profiles. One area of interest is the role of antibodies against neuronal antigens in the pathogenesis of axonal and demyelinating Guillain-Barré syndromes. Another focus of our research are mechanisms of nerve regeneration in chronic inflammatory demyelinating polyradiculo-neuropathy (CIDP) and multifocal motor neuropathy (MMN). These disorders are frequently associated with severe neurological deficits and poor functional recovery. We are exploring the underlying causes of failed nerve regeneration in experimental models and try to identify innovative biomarkers such as DTI in humans in order to develop novel therapeutic approaches for these conditions.

**Chemotherapy-induced polyneuropathy**

About thirty percent of all cancer patients receiving chemotherapy suffer from chemotherapy-induced peripheral neuropathy (CIPN), which makes CIPN to one of the most significant side effects of many widely used antineoplastic drugs. CIPN is often dose limiting and severely affects the quality of life in cancer survivors. Several classes of chemotherapy drugs are associated with CIPN, including platinum compounds, vinca alkaloids, taxanes and bortezomib. We are exploring in *in vitro* and *in vivo* models the pathogenesis of CIPN with the aim to translate these findings in new therapeutic approaches to prevent CIPN.
Amyotrophic lateral sclerosis (ALS)

Amyotrophic lateral sclerosis (ALS) is a progressive motor neuron disease. The pathogenesis of this disorder is incompletely understood. It is assumed that mitochondrial dysfunction and inflammatory processes result in degeneration of motor neurons. We explore in in vitro and in vivo models novel therapeutic approaches to support the regeneration of motor neurons in order to ameliorate the disease course in humans.

Diseases of the autonomic nervous system

Like sensory or motor nerves, autonomic fibers can be affected in many neuropathic conditions. Of utmost clinical relevance is autonomic nerve fiber dysfunction when it occurs in Guillain-Barré syndrome (GBS). Autonomic dysfunction in GBS results in life-threatening alteration of cardiovascular function, such as cardiac arrhythmia or blood pressure fluctuations. In experimental models we are studying the interaction between an aberrant humoral immune response and neuroendocrine functions in the autonomic nervous system that might be relevant not only for GBS, but also for other disorders with impaired function of autonomic nerve fibers.

Key publications:


**funding:** B.Braun-Stiftung, Deutsche Krebshilfe, Industry. Past funding: Deutsche Forschungsgemeinschaft (DFG), International GBS/CIDP Foundation, Else Kröner-Fresenius Stiftung, intramural university funding