

Translational Research Center (TRC)

Speakers

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Aims and structure

In 2014 the Translational Research Center (TRC) was inaugurated at the Faculty of Medicine with an exemplary concept and infrastructure. The newly established research building enables physicians and basic scientists to collaborate closely and develop novel approaches for diagnosing and treating diseases. Areas of expertise covered in the center include aspects of inflammation-, tumor-, kidney-, heart-, and circulation research.

The concept for the TRC was developed in 2007 in preparation for a competitive call for novel research centers according to § 91 b Section 1 No 33 GG, and received a positive evaluation through the German Council of Science and Humanities ("Wissenschaftsrat"). A central approach of the TRC is a highly efficient and flexible use of laboratory space. The research modules have a uniform floor plan. All laboratory areas are linked to a central middle zone which harbors multiuser equipment in order to ensure easy access and efficient utilization of advanced technologies. All research areas are connected with an open structure to facilitate intense interaction. To this end, a central communication area was created for all personnel.

Important aims of the TRC are the dynamic development of present and the integration of new research areas especially in the framework of career development for younger scientists. An important structure component to achieve these tasks are the C modules. These laboratories are distributed between the modules of the core groups (A modules), which represent the main research focuses. C modules are allocated transiently and preferably to junior researchers who are sponsored by external third party agencies in order to enable them an optimal connection to all instruments, equipment, and expertise available in the TRC. In 2019, all existing C modules will be filled with research units from the Departments of Medicine 3 and 4, the Department of Surgery, the Institute of Radiology and the Institute of Nuclear Medicine. Furthermore, a laboratory for pregnant women was established in

order to provide separately from the multiuser concept of the TRC a laboratory where certain techniques can be carried out under strictly controlled conditions excluding exposure to harmful chemicals during the pregnancy.

At the end of 2018, the staff of the TRC consisted of 179 employees from 14 different nations.

Research

The TRC assembles research groups of the Departments of Internal Medicine, Nuclear Medicine, Surgery, the Division of Transfusion Medicine and Hemostaseology, and of the Institutes of Pathology and Radiology in one building. Approximately one quarter of laboratory space is temporarily allocated for projects initiated by newly established principal investigators. In addition, the center will contribute to national and international networks in translational research, based on current and future collaborations of the participating scientists.

The research goals of the TRC focus on diseases that play a central role for patient care of the participating institutions. Research topics include the regulation of cardiac and renal development, the identification of novel therapeutic targets in inflammatory bowel disease, the development of new strategies for immunization, certain aspects of tumor and transplantation immunology, the mechanisms of immunomodulation of angiogenesis and immune evasion of tumor cells, as well as the relevance of hypoxia and inflammatory processes for renal diseases. Research on specific pathogenic processes that play a role in the development of various diseases affecting different organ systems provides overarching synergies. For example different mechanisms of endothelial activation are being studied by five research groups within the TRC, including the studies of tumor angiogenesis, metastasis formation, transendothelial migration, and development and progression of atherosclerosis. Immune reactions are being addressed in the context of angiogenesis, tumor therapy, and as a pathogenic driver of inflammatory bowel disease, kidney disease, and atherosclerosis. The establishment of a zebra fish unit expanded the methodological spectrum and allows for additional joint research strategies.

The high research quality of the TRC is documented by (among others) six research articles published in 2017/18 under the first and last authorship of TRC members in internationally high-ranking journals, such as *Leukemia*, *Nature Medicine*, *Nature Immunology*, *Gastroenterology*, *PNAS*, and *Gut*.

