

# **Establishment of a Liver Research Network at the Medical University of Graz**

## **Author**

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## **1. Preamble**

### **a. Core contents**

The main goal is to contribute to the standing of the Medical University of Graz (MUG) by improving its national and international position in the field of hepatology.

In line with the basic philosophy of the MUG, which emphasizes research, teaching and patient care at the highest level of quality, we aim for excellence in the field of hepatology in those same areas.

Central to this is interdisciplinary research on clinically relevant disease mechanisms, with the development of new diagnostic markers and innovative treatment concepts for liver disease, as well as the implementation of these newest findings to optimize interdisciplinary/multidisciplinary patient care.

These aims can only be achieved through consolidation of scientific (basic and clinical research) and clinical facilities (patient care).

Coordination and cooperation between basic and clinical research and clinical application (translational research) in hepatology is to be achieved through more efficient use of existing resources which, in turn, should strengthen the operation in general.

The pursuit of excellence is to be seen in the context of an integrated approach in medicine as the basic idea behind research, teaching and patient care (bio-psycho-social model).

The establishment of a liver research network and liver research center will serve to spotlight the strengths and enhance the image of hepatology at the MUG, on the national and international levels.

### **b. The significance of hepatology and its future development**

Liver diseases and their sequelae are an important public health problem in Austria in general and Styria in particular. As the liver plays a central role in metabolism, this

organ is particularly vulnerable to metabolic diseases (e.g. metabolic syndrome, diabetes mellitus). Further increase in the incidence of liver diseases, particularly of metabolic and neoplastic origin, is to be expected.

Research on the pathogenesis, diagnosis and treatment of liver disease, as well as clinical clarification and care of patients with liver diseases, is of common interest to a number of key institutes and clinical divisions of the MUG.

Due to the central role of the liver in metabolism, hepatology is closely affiliated with a number of disciplines in the basic and clinical sciences. It so can be expected that hepatology will be in the forefront with regard to the translation of the results of basic research into clinical use in the sense of modern molecular medicine (e.g. diagnostics, biologicals, gene therapy, stem-cell therapy).

Liver diseases will come to occupy a more prominent position in the future and internationally renowned hepatology working groups are already in place in Graz. Further support of the field of hepatology at the MUG in the form of a liver research network (center of excellence) makes sense from the point of view of health policy and research strategy and offers great promise of success.

The establishment of a multidisciplinary liver research network will nourish important synergies through the pronouncedly interdisciplinary nature of hepatology and provide positive impulses for related and neighboring disciplines.

Due to the central role of the liver in the metabolism of pharmaceutical substances, hepatology is importantly involved in the development and testing of new medicinal approaches (drug safety). A greater emphasis on hepatology at the MUG so would make Styria an even more desirable site for pharmaceutical research and would attract biotechnology and pharmaceutical companies to the area.

### **c. Tasks of the liver research network**

A main aim of the future network/center is the interdisciplinary and multidisciplinary involvement and interconnection of all interested groups and divisions working in hepatology, in the sense of a virtual merger in research, teaching and patient care (basic research, clinical research, excellence in patient care).

The establishment of a network/center is to be seen as a complement to and not a substitute for individual initiative.

The network is intended to coordinate the following activities:

- Basic research, special areas of research
- Clinical research, studies, cooperation with firms and industry (more effective presence as a joint research initiative)
- Teaching (postgraduate training, Ph.D. program)
- Patient care with
  - focus on problem cases that go beyond the scope of routine clinical care

- special attention to scientifically interesting diseases that require multidisciplinary management
- a virtual network of existing facilities to form a tertiary hepatology center

Bundling of expertise, achievement of a critical mass to increase clout at the local, national and most importantly the international level.

Nurturing of synergies at the level of content, organization and methodology to reach goals more quickly and efficiently.

Coordination of joint activities to increase international competitiveness in hepatology research (including acquisition of third-party funds) and clinical care.

Active involvement of related disciplines, increasing accessibility in hepatology research for related disciplines, creation of new interactions.

Common use of resources (space, equipment, personnel, intellectual resources, know-how), synergy effects through information transfer

Facilitation and help in the planning and performance of hepatological research projects through exchange of experience, joint discussion forums and technical assistance.

#### **d. Main subjects of interest**

- Cholestatic liver disease
- Fatty liver disease, steatohepatitis (metabolic syndrome, alcohol)
- Acute-on-chronic liver failure
- Liver dialysis, liver transplantation
- Viral hepatitis
- Hepatocellular carcinoma

#### **e. Exemplary international institutions**

NIH/NIDDK Digestive Diseases Research Core Centers  
<http://www.niddk.nih.gov/fund/other/centers/htm#Digestive>

Yale Liver Center  
<http://www.niddk.nih.gov/fund/other/centers/yaleddrec.htm>

## **2. Implementation**

### **a. Partners (involved disciplines and institutions)**

Main areas: internal medicine, surgery, anesthesiology, pathology, radiology, laboratory medicine, molecular biology and biochemistry (see diagram)

Possible participants and areas of cooperation:

- Internal Medicine: gastroenterology and hepatology, endocrinology and metabolism (fatty liver disease and metabolic syndrome), intensive-care medicine (liver failure), nephrology and hemodialysis (liver dialysis), hematology (stem-cell therapy), oncology (hepatocellular and cholangiocellular carcinoma), pulmonology (hepatopulmonary syndrome, portopulmonary hypertension)
- Pathology: alcoholic and non-alcoholic steatohepatitis, drug-induced hepatopathy, liver fibrosis, cirrhosis of the liver
- Surgery: general surgery, transplantation surgery
- Radiology: molecular imaging, CT, MR, interventional radiology, local treatment of HCC
- Laboratory medicine: liver and lipid metabolism
- Molecular biology and biochemistry: liver and lipid metabolism
- Medical biology and human genetics: chromosomal instability in HCC
- Anesthesiology and intensive-care medicine
- Pediatrics
- Pediatric surgery
- Pharmacology
- Physiology: liver dialysis, kinetics
- Hygiene: viral hepatitis
- Psychiatry, Medical Psychology: addiction and metabolic syndrome
- External partners: Karl-Franzens University Graz (Prof. Zechner), Technical University, Graz (Prof. Trajanoski, Prof. Glieder), Oridis Biomed

#### **b. Administration of the Center**

The administration/coordination of the liver research network is primarily the responsibility of the Professor of Medicine with special focus on Experimental and Molecular Hepatology (as appointed/reappointed by the Office of the Rector, MUG). The scientific advisory board is made up of representatives of the participating divisions, institutes and external advisors, see enclosed organigram. The scientific advisory board will meet quarterly, and yearly with the steering committee. There will be an external evaluation every five years.

#### **c. Implementation in clinical research**

- Coordination as to content of local, national and international clinical studies in order to create a focus of interest, with emphasis on studies with an interdisciplinary approach (e.g. metabolic syndrome, liver failure)
- Implementation of results of basic research in clinical application (pilot studies, particularly the implementation of research results obtained from MUG research)
- Initiation of and participation in high-level international clinical studies with innovative treatment approaches

- Expertise on drug safety, not limited to hepatological applications

#### **d. Implementation in basic research**

- Coordination and inclusion of basic research in hepatology at the MUG in local (TUG, KFUG), national (FWF, GenAU) and international (EU, NIH) research projects
- Organization of a special research area (SRA) devoted to “Liver and metabolic syndrome” at the MUG (in cooperation with the KFUG and TUG), perhaps on the basis of a doctoral program
- Coordination of a program in hepatology for incoming and outgoing scientists

#### **e. Implementation in postgraduate training**

- Creation, in cooperation with the MUG, of a Ph.D. program (hepatology as an example of translational research and molecular medicine)
- Organization of training in an interdisciplinary specialty and postgraduate training in hepatology (including lecture series in peripheral hospitals)
- Organization of an interdisciplinary seminar series on hepatological subjects for students, Ph.D. candidates, postdocs, etc., with national and international guest speakers (external enrichment program)
- Establishment of a Graz Liver Week as an instrument for postgraduate training and public relations, with high national and international appeal

#### **f. Implementation in patient care**

- Coordination of interdisciplinary hepatological patient care on a consulting basis for problem cases that require an interdisciplinary/multidisciplinary approach and/or are of special scientific interest
- Interdisciplinary hepatological consultations in problem and “interesting” cases as an instrument for quality assurance, exemplary patient care and advanced training
- Interdisciplinary discussions and case conferences
- Introduction of state-of-the-art quality assurance measures in patient care, such as the creation of guidelines and standard operating procedures
- Interface management to optimize cooperation between divisions and institutes, e.g. clinical specialties – diagnostic specialties, internal medicine – surgery, MUG/Regional University Hospital, Graz – peripheral hospitals (contact with the latter, including telephone and e-mail consultations as first contact in challenging cases)
- Professional public relations and regular information for referring physicians and patients with lecture series (e.g. patient days) and informational mailings

#### **g. Infrastructure**

- Basic research: ZMF and labs of the participating institutions cover need
- Patient-oriented research and patient care: integrative and more efficient use of existing bed resources (including intensive care); as a future vision, “liver beds” for interdisciplinary care for problem and demanding cases requiring interdisciplinary and multidisciplinary care

#### **h. Personnel requirements**

- Study nurses for clinical studies
- Administration: business administrator, secretary
- Existing medical and scientific personnel
- Third-party funded personnel for scientific projects

#### **i. Financing of research**

- Support from MUG
- State of Styria (liver center as an important infrastructural factor in Styria)
- Acquisition of third-party research funds:
  - Organizations that support research (FWF, FFF, ÖNB, BMBWK, EU)
  - Industry (e.g. Oridis)
  - Christian Doppler Gesellschaft
  - Ludwig Boltzmann Institute
  - Fundraising