



# CENTER OF EXCELLENCE

## TIMed CENTER

ACHIEVE MORE  
THROUGH RESEARCH & DEVELOPMENT

[www.timed-center.at](http://www.timed-center.at)



**TIMed CENTER**  
Technological  
Innovation in Medicine

# ACHIEVE MORE WITH AUSTRIA'S STRONGEST RESEARCH UNIVERSITY

**Successful businesses know from experience: Every euro that goes into research and development pays for itself many times over. This is because innovations give those businesses a decisive competitive edge, generating revenue and securing jobs in the long run.**

As a centre of research, Upper Austria is in the fast lane, and the University of Applied Sciences Upper Austria (University of Applied Sciences Upper Austria) has become a driving force. Austria's most research-intensive university of applied sciences offers innovative businesses its four campuses and approximately 400 professors and academic staff. Currently, over 400 projects in 17 specialist areas of research are being implemented. The areas of applied research range from IT (University of Applied Sciences Upper Austria Hagenberg Campus) to Medical Engineering and Applied Social Sciences (University of Applied Sciences Upper Austria Linz Campus) and Management (University of Applied Sciences Upper Austria Steyr Campus) to Engineering (University of Applied Sciences Upper Austria Wels Campus). Perfect networking of the campuses makes it possible to achieve an optimal overall solution for each project.

- » **Medical Engineering:** An interdisciplinary field of research and work at the intersection of engineering, natural sciences and medicine.
- » **Digital Health:** ICT methods and tools for digitisation and digital transformation in medical practice and research as well as for medical devices and health care administration.
- » **Medical Materials:** Spans the development and use of new materials in medicine for therapeutic, diagnostic and/or research applications. They form the basis for a multitude of innovations.

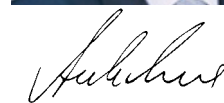
The Center of Excellence for Technical Innovation in Medicine (TIMed CENTER) develops interdisciplinary solutions to technological issues in the life sciences.

Together with the Johannes Kepler University, the FH health professions, non-university researchers and Upper Austrian healthcare institutions—including the Kepler University Hospital and hospitals operated by religious orders and the State of Upper Austria—the TIMed CENTER makes a significant contribution to excellence in medical (technical) research in Upper Austria.



  
Mag. Thomas Stelzer  
State Governor of Upper Austria



  
Markus Achleitner  
Minister of Economy of Upper Austria



# COOPERATION MADE EASY

**With more than 400 researchers, the University of Applied Sciences Upper Austria is on hand as a flexible and reliable partner for addressing research and development issues with businesses and institutions from industry and society.**

**The possibilities for cooperation are numerous and varied:**

- » Applied R&D projects with partner companies, health and social services and public institutions
- » Academic research projects
- » International R&D projects
- » Symposia and workshops
- » Students' bachelor's and master's theses

Project time frames can range from a few months to up to five years.

The University of Applied Sciences Upper Austria offers its R&D support to businesses and institutions from industry and society.

This includes on the one hand businesses which lack personnel resources or have limited financial resources for their own research and development activities (e.g. small and medium-sized enterprises).

On the other hand, solutions for companies needing specialised support (e.g. in the form of special equipment) are also available. For the University of Applied Sciences Upper Austria's cooperation partners, a joint project is, above all, a financially straightforward and efficient undertaking.

Geared towards the needs of the client, innovative solutions will be developed that can be put directly into practice.



*Dr. Gerald Reisinger  
President University of Applied Sciences Upper Austria*



*Prok. Prof. Priv.Doz. Dipl.-Ing. Dr. Johann Kastner  
Vice President FH OÖ Forschungs & Entwicklungs GmbH*



### Thematic Areas:

- » Biomedical Data Analysis
- » Biomedical Sensor Technology
- » Biomimetics and Material Development
- » High Resolution Imaging
- » Medical Simulators
- » Drug Characterisation

# ACHIEVE MORE THROUGH TECHNICAL INNOVATION IN MEDICINE

The **TIMed CENTER** bundles the strengths of the University of Applied Sciences Upper Austria faculties in Hagenberg, Linz, Steyr and Wels at the interface between technology and medicine in order to develop interdisciplinary solutions. This Center of Excellence concentrates its research and development activities in six fields of research.

## Biomedical Data Analysis

- » Software for the identification of relationships and patterns in biomedical data
- » Automated analysis and characterisation of (sub)cellular structures
- » Prediction of complications and risk factors from clinical trial data

## Biomimetics & Material Development

- » Imitation of mechanical and chemical properties of biological systems
- » Lithographic structuring and biomolecular analysis on a nanometre scale
- » Production of organ-like carrier structures for medical research

## Biomedical Sensor Technology

- » Intelligent sensors in rehabilitation and prosthetics, motion analysis and activity measurements using signal acquisition, pattern recognition and machine learning

## Drug Characterisation

- » Research into phytogetic drugs for the prevention of human and animal diseases
- » Biological test systems for the characterisation of drugs at the cellular level
- » Identification and quantification of bioactive ingredients

## High Resolution Imaging

- » Development of highly sensitive detection techniques and methods for diagnostics
- » Nanoscopic characterisation of biomedical samples with real-time analysis
- » Surface analysis and manipulation in the  $\mu\text{m}$  and  $\text{nm}$  range

## Medical Simulators

- » Design of hybrid surgical simulators using artificial anatomical structures, computer models and virtual reality for medical training



‘At the JRC for Phytogetic Drug Research, the role of phytogetic agents as modulators in the prevention and treatment of diabetes and obesity is being explored. By participating, we want to lay the foundation for becoming one of the leading enterprises in personal nutrition.’

**Dr. Tobias Kühne**  
(CSO PM-International AG)

# ACHIEVE MORE WITH THE TIMed CENTER CORE FACILITIES

## Cutting-Edge Infrastructure on Each Campus

At its Core Facilities, opened in 2018, the TIMed CENTER provides access to shared resources, including high-end instruments, cutting-edge technologies, state-of-the-art methods, experts and services to address complex RDI issues.

- » 3D medical nanolithography for additive manufacturing
- » Nanoscopic characterisation of cellular processes
- » Dynamics and interactions of bio-nanostructures
- » Bioinformatics and image processing
- » Medical simulators
- » Research on bioactive drugs

## Current Research Projects

- » **BIOCETA** / Biophysical characterisation of bioparticles / Creation of a quality standard for bioparticle-based industrial applications for better disease detection and treatment.
- » **CLINDAT** / Data-based prediction for medical controlling / Creation of mathematical models for possible complications and specific risk factors in certain combinations of treatments.
- » **FEEL** / Feedback for prosthetic limbs / Improvement of prosthesis perception in amputation patients by passing pressure information to leg stumps.
- » **LEIVMED II** / Key figure-based process optimisation in hospitals / Determination of transparent key figures and benchmarks with regard to outcome, process and costs for quality management.



## CROSS-FACULTY KNOW-HOW

While Hagenberg provides important IT know-how, the researchers from Linz contribute their expertise in the areas of high-resolution imaging, nanolithography, medical simulators and motion measurement. In collaboration with the Wels Campus, drug research is driven by quantification of protein-protein interactions and characterisation techniques. Colleagues from Steyr contribute their know-how in the area of core clinical processes and risk-adjusted benchmarking in the healthcare sector.

# CURRENT DEGREE PROGRAMMES

- » **METAMMI** / Metrology for 3D-printed medical implants / Introduction and establishment of officially accepted measurement methods for assessing the quality of 3D-printed implants.
- » **PHYTOGENE WIRKSTOFFE** / Josef Ressel Center for Phytogetic Drug Research / Development of biological test systems for detailed determination of the modes of action of drugs of plant origin.
- » **PPI-Framework** / Identification of protein-protein interactions / Protein-protein interaction research using algorithms that evaluate micro-patterning assays and mass-spectrometry data.
- » **SPUSI** / Patient phantoms for ultrasound diagnosis / Development of realistic human imaging (patient phantoms) to improve ultrasound imaging and diagnostic quality.
- » **Supracellular Medical Research** / Preparation of organ-like carrier structures / Lithographic structuring and nanoscale biomolecular analysis for the development of 3D model systems for medical research.
- » **MEDUSA** / Flagship project Medical EDUcation in Surgical Aneurysm clipping /Innovative training and planning platform
- » for neurosurgeons to prepare for complex procedures on the brain using hybrid simulators.

## Hagenberg Campus

- M Data Science and Engineering
- B Medical and Bioinformatics

## Linz Campus

- M Applied Technologies for Medical Diagnostics
- M Medical Engineering
- B Medical Device Technology

## Steyr Campus

- B Process Management and Business Intelligence

## Wels Campus

- B M Food Technology and Nutrition

B = Bachelor's programme, M = Master's programme

## YOUR POINT OF CONTACT



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