BMBF MI-I: MIRACUM

Speaker
Prof. Dr. biol. hum. Hans-Ulrich Prokosch

Contact
Dr. rer. nat. Stefanie Knöpfel

Address
Chair of Medical Informatics
Wetterkreuz 13
91058 Erlangen
Phone: +49 9131 8526721
Fax: +49 9131 8526754
stefanie.knoepfel@fau.de
www.miracum.de

Aims and structure

The MIRACUM Consortium (Medical Informatics in Research and Care in University Medicine) was first funded for the nine month conceptual phase of the Medical Informatics Funding Scheme of the BMBF (August 2016 to April 2017). Based on its successful pilot projects and its compelling and visionary concept, it received continued funding with an amount of 37.3 million euro for the four-year implementation and networking phase (2018-2021). Prof. Dr. H.-U. Prokosch (Chair of Medical Informatics) is responsible for the coordination of the consortium. Prof. Dr. Dr. h.c. J. Schüttler, Dean of the Faculty of Medicine, is the co-investigator for the Faculty of Medicine and UK Erlangen. In 2017 the BMBF announced an additional funding program for university hospitals which did primarily not receive funding for the implementation and networking phase to apply for admission in one of the four funded consortia. This led to the extension of consortium with two new university hospitals. MIRACUM: This are now ten universities with university hospitals (Dresden, Erlangen, Frankfurt, Freiburg, Gießen, Greifswald, Magdeburg, Mainz, Mannheim, and Marburg), two universities of Applied Sciences (Hochschule Mannheim and Technische Hochschule Mittelhessen), and Averbis (Freiburg), the industrial partner of the consortium.

The aim of the project is to make data from numerous heterogeneous IT systems and databases in patient care and medical research accessible for innovative IT solutions and to support translational research as well as diagnostic and therapeutic decisions in health care processes. Together with the Medical Information and Communication Center of the UK Erlangen, the Chair of Medical Informatics establishes the Erlangen Data Integration Center and provides means for integrating this local data integration center into a consortium-wide and federated cross-hospital network that supports various aspects of data sharing.

Research

The establishment of data integration centers and their federated application in various research scenarios is based on an ecosystem of modular and reusable open source IT tools which will be developed and adapted by the MIRACUM competence centers at the sites of the respective partners and which will stepwise be integrated into the eight MIRACUM data integration centers. The data flow (strictly adhering to data protection regulations and the patient s consent) originates from the routine IT systems of a university hospital and typically requires data harmonization and the mapping to a jointly defined common data model to then result in a data integration step that comprises various types of research data repositories. The concept of data sharing is based on both, a strictly federated approach and the philosophy to „Bring the analysis to the data". Based on first successful MIRACUM analysis results, this concept was applied to initiate an early cross-consortial demonstrator study with research questions focusing on rare diseases and on comorbidities to illustrate early interoperability between the MI-I consortia.

In the four years to come, MIRACUM will focus on the following three use cases:
1. Alerting in care – IT support for patient recruitment
2. From data to knowledge – A predictive clinico-molecular knowledge tool
3. From knowledge to action – Support for molecular tumor boards

Based on the proven MIRACUM data integration center concept, all MIRACUM partners already joined early 2018 to apply for additional funding to establish a Nationwide Registry for Recurrent Urolithiasis of the Upper Urinary Tract (RECUR). This application receives funding starting in May 2019 and will for the first time also include a non-university hospital (Waldkrankenhaus Erlangen) in the network and also further increase the data sets included in the registry with patient generated data via a mobile app for patient recorded outcomes.

Teaching

MIRACUM is also working on the improvement of both, education and the advanced training of Biomedical Informatics for clinicians, basic scientists, researchers in medical informatics, and computer scientists. To this end first online courses and webinars have been designed and regular online tutorials have been established for members of the MIRACUM team. In the current funding phase MIRACUM aims at establishing the cross-university part-time master degree program „Biomedical Informatics und Medical Data Science".

MIRACUM
Medical Informatics in Research and Care in University Medicine