

Towards an OHDSI-based Data-Sharing Infrastructure in Germany

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on behalf of the MIRACUM consortium



Federal Ministry
of Education
and Research

Motivation



We need

- coordinated
- secure
- data protected
- governed

access to data

based on a trustworthy framework of technologies and policies

The German Medical Informatics Funding Scheme

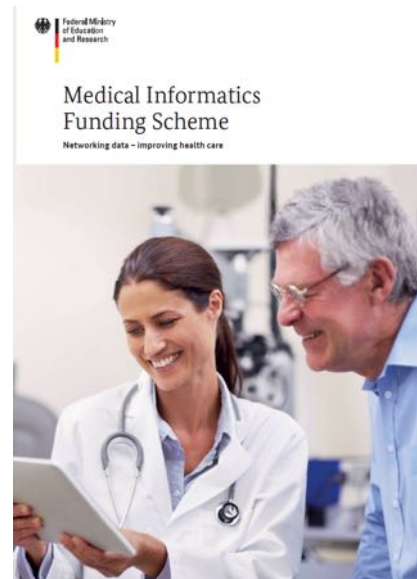
- Improve **research opportunities** and **patient care** through innovative IT solutions (initially at university hospitals)
- Intensify the **exchange and sharing of data** between the research community and the health care delivery system
- Position medical informatics as a progressive field in research, **teaching and continuing education**
- As a key element of the funding scheme **data integration centres** are to be set up and interlinked by the university hospitals

Förderkonzept Medizininformatik

Daten vernetzen – Gesundheitsversorgung verbessern



Bild: Bundesforschungsministerin Wanka auf der MEDICA (Bildquelle: Messe Düsseldorf / cslmann)



The initiative so far...

Förderkonzept Medizininformatik

Daten vernetzen – Gesundheitsversorgung verbessern





Bild: Bundesforschungsministerin Wanka auf der MEDICA (Bildquelle: Messe Düsseldorf)



ADMIRE

- Westfälische Wilhelms-Universität Münster
- Rheinische Friedrich-Wilhelms-Universität Bonn
- Universität Duisburg-Essen
- Universität zu Köln

DIFUTURE

- Klinikum rechts der Isar der Technischen Universität München
- Universität Augsburg
- Ludwig-Maximilians-Universität München
- Eberhard-Karls-Universität Tübingen

HDACR

- Charité Universitätsmedizin Berlin
- Universitätsklinikum Ulm
- Universitätsklinikum Würzburg

HIGHmed

- Universitätsklinikum Heidelberg
- Georg-August-Universität Göttingen
- Medizinische Hochschule Hannover
- Deutsches Krebsforschungszentrum, Heidelberg

MIRACUM

- Friedrich-Alexander-Universität Erlangen-Nürnberg
- Johann Wolfgang Goethe-Universität Frankfurt am Main
- Albert-Ludwigs-Universität Freiburg
- Justus-Liebig-Universität Gießen
- Deutsches Krebsforschungszentrum, Heidelberg
- Ruprecht-Karls-Universität Heidelberg
- Universitätsmedizin der Johannes-Gutenberg-Universität Mainz
- Philipps-Universität Marburg

share-it

- Universitätsmedizin Greifswald
- Technische Universität Dresden
- Universitätsklinikum Hamburg-Eppendorf
- Universitätsklinikum Schleswig-Holstein, Campus Lübeck
- OFFIS e.V., Oldenburg

SMITH

- Universität Leipzig
- RWTH Aachen
- Universitätsklinikum Jena


■ Nationales Steuerungsprogramm – Begleitstruktur
■ MFT/VDITM, Berlin

○ Konsortien, Institutionen, Standorte
□ Konsortialführung

10.07.2017 | PRESSEMITTEILUNG: 083/2017

Bessere Therapien dank Medizininformatik

BMBF fördert Medizininformatik mit über 150 Millionen Euro / Wanka: "Patientinnen und Patienten noch besser beraten und behandeln"



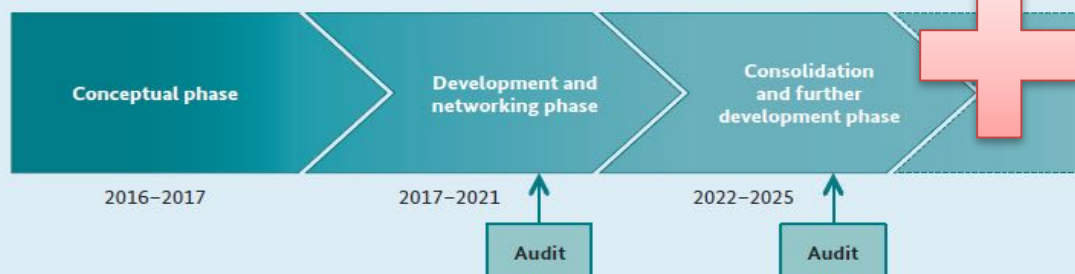
Bundesforschungsministerin Johanna Wanka und Alexander Hörbst mit den Vertretern der vier Konsortien, die für eine Förderung vorgesehen sind. v.l.: Alexander Hörbst (Vorsitzender des Gutachterkreises), Klaus A. Kuhn (DIFUTURE), Markus Löffler (SMITH), Roland Eils (HIGHmed), Johanna Wanka, Hans-Ulrich Prokosch (MIRACUM)

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Announcement 2015

Conceptual Phase 2016-2017

Development and Networking Phase 2018-2021



- Supplementary Funding for
- new professorships
 - young researcher groups and
 - non-funded university hospitals

The MIRACUM consortium

- Medical Informatics in Research and Care in University Medicine
 - eight University Hospitals and Medical Faculties, two Universities of Applied Science, and one industrial partner
 - across five German States
 - associated with four German Health Research Networks
- comprising $\frac{1}{4}$ of all German University Hospitals
- handling clinical and research data of more than 10 Mio patients



Usecases of MIRACUM

Alerting in Care

- *IT Support for Patient Recruitment*
- Medical Informatics / Clinical Trials

From Data to Knowledge

- *Clinico-molecular Predictive Knowledge Tool*
- Biostatistics / Prediction Models / Med. Inf.

From Knowledge to Action

- *Support for Molecular Tumor Boards*
- Bioinformatics / Medical Informatics / Precision Medicine

The MIRACUM ecosystem is based on ...



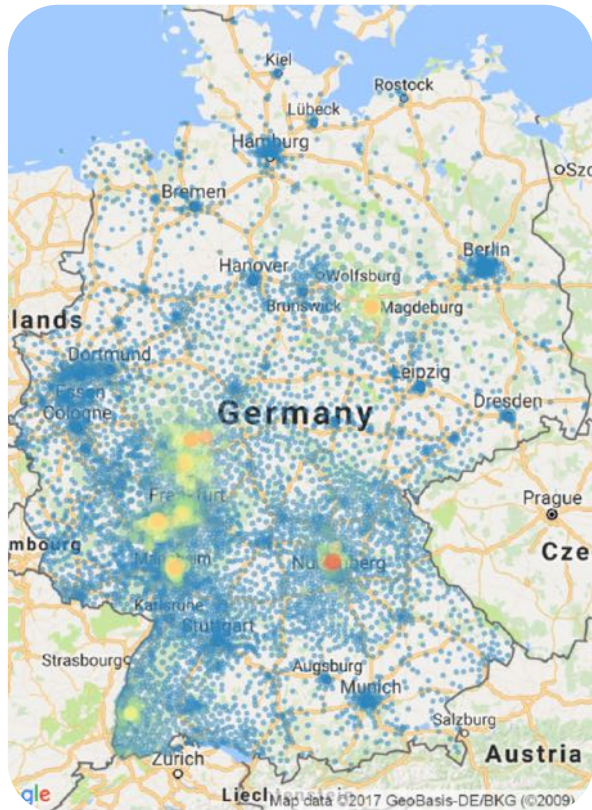
- Medical Informatics Reusable Ecosystem of Open source Linkable and Interoperable software tools – X

MIRACOLIX

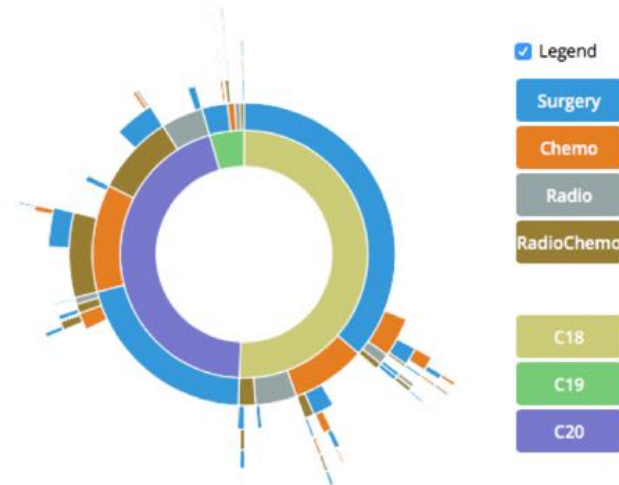
- MIRACOLIX is
 - pragmatic
 - modular
 - reusable
 - open source
 - interoperable
 - federated



Example: Feasibility



Catchment Area of MIRACUM Partners



*Combined Sunburst-Plot of 18,376 Cases
from 11 University Hospitals*

- 11 University Hospitals
- 3,3 Mio Patients
- 30 Mio Diagnoses
- 23 Mio Procedures

Current work and first results

- Full import of the clinical data warehouse
- Mapping, mapping, mapping
 - National SNOMED license on the way
 - ICD10GM, OPS (procedures)!, cost?
- App infrastructure
 - OMOP on FHIR (<http://omoponfhir.org>)
 - SMART on FHIR (<https://smarthealthit.org>)
 - FHIR-enabled wearables
- Automatic data sharing based on a central query broker
 - Inspired by li2b2 (<https://github.com/li2b2>)
- Interactive queries and (geo-)visualization
 - based on Kibana

See you!