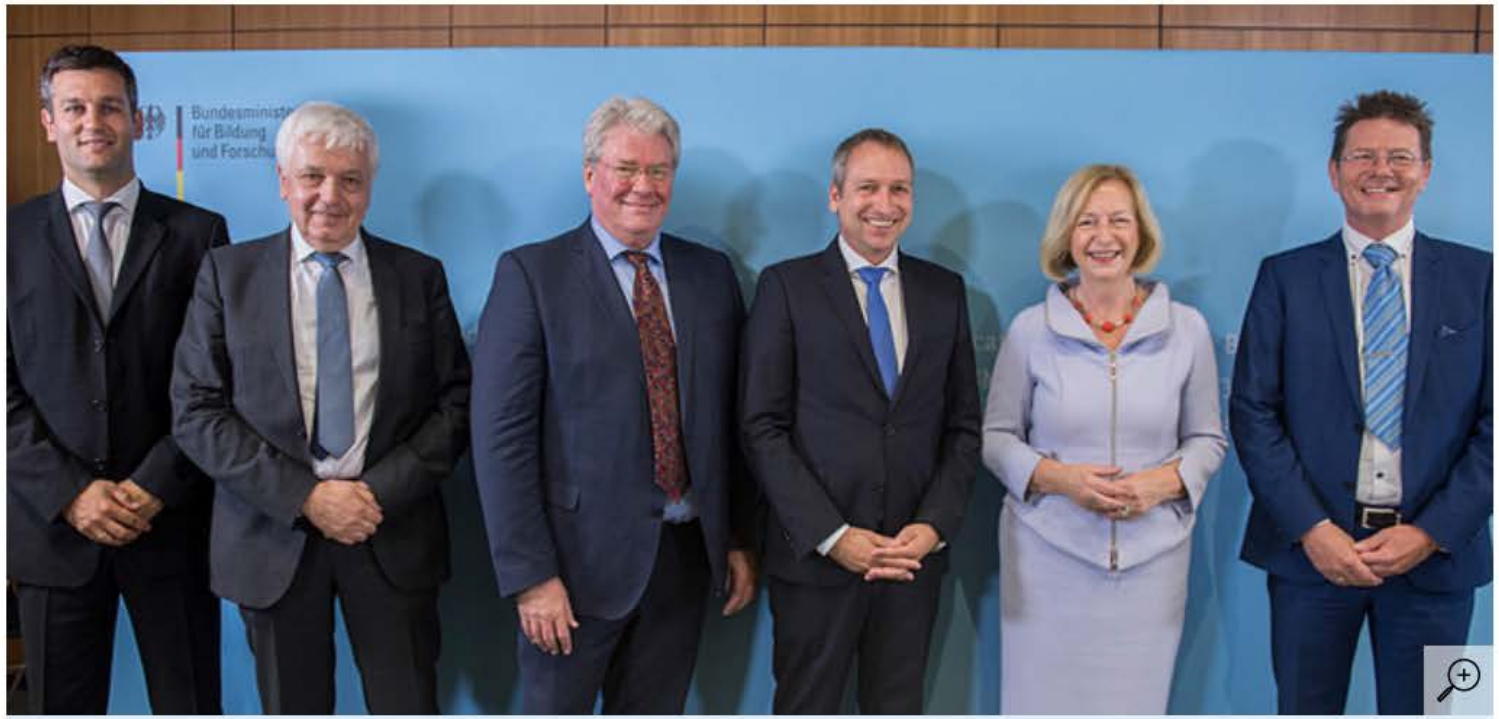
10.07.2017 | **PRESSEMITTEILUNG: 083/2017**

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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MEHR ZU: → zurück zur Übersicht

Pressereferat

Pressemitteilungen

Bildmaterial

LINK

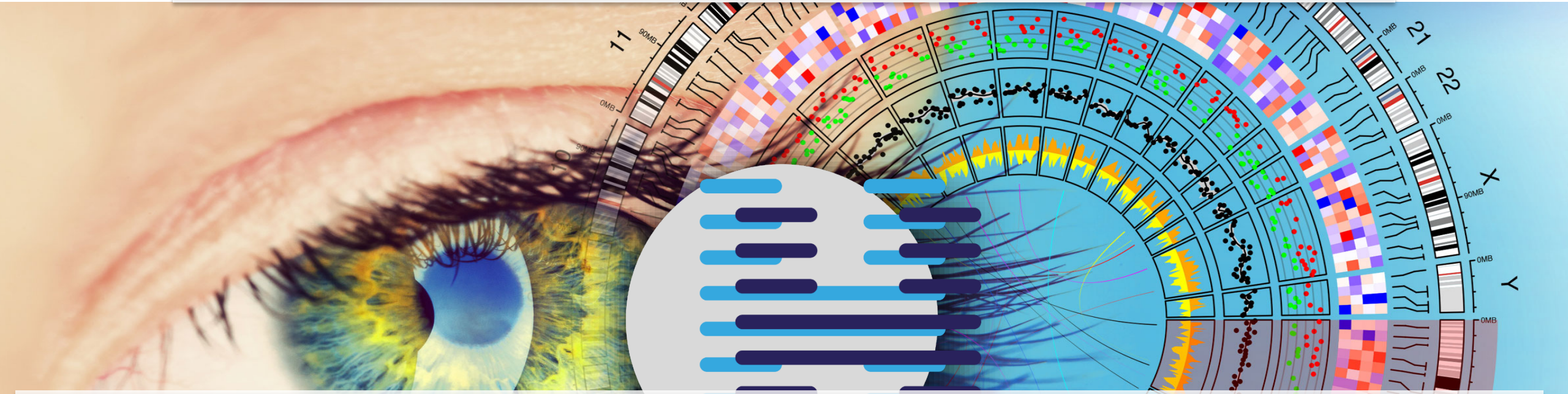
↗ Medizininformatik-Initiative: Digitale Vernetzung im Gesundheitssystem stärken

VIDEO

Medizininformatik: Ein Schatz, den es zu heben gilt

ZUM THEMA MEDIZININFORMATIK UND DEN GEFÖRDERTEN

HiGHmed
Medical Informatics



i2b2/tranSMART@HiGHmed:
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Paris, October 5, 2017, i2b2/tranSMART 2017 European Meeting

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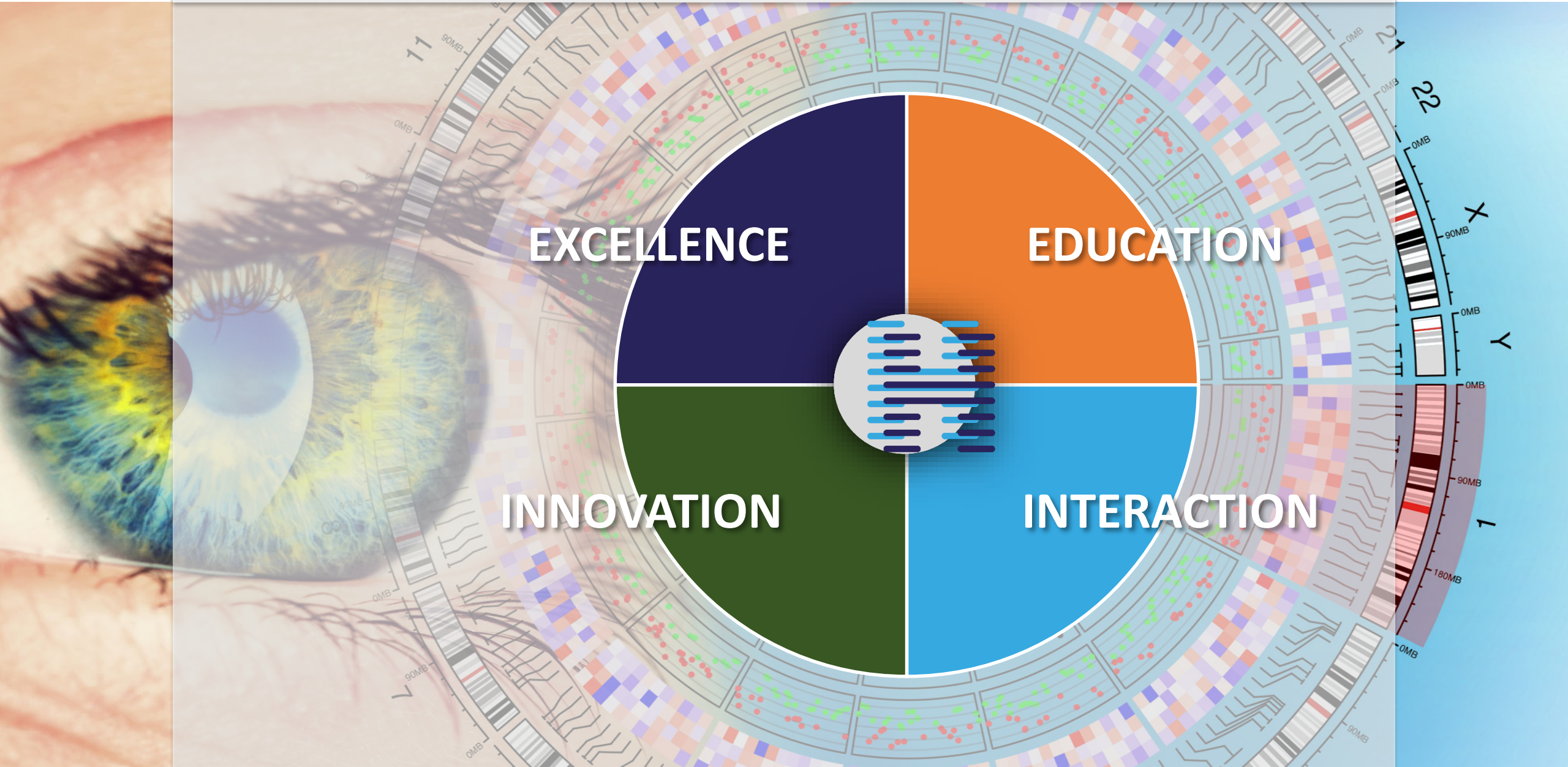
The HiGHmed Approach

HiGHmed
Medical Informatics



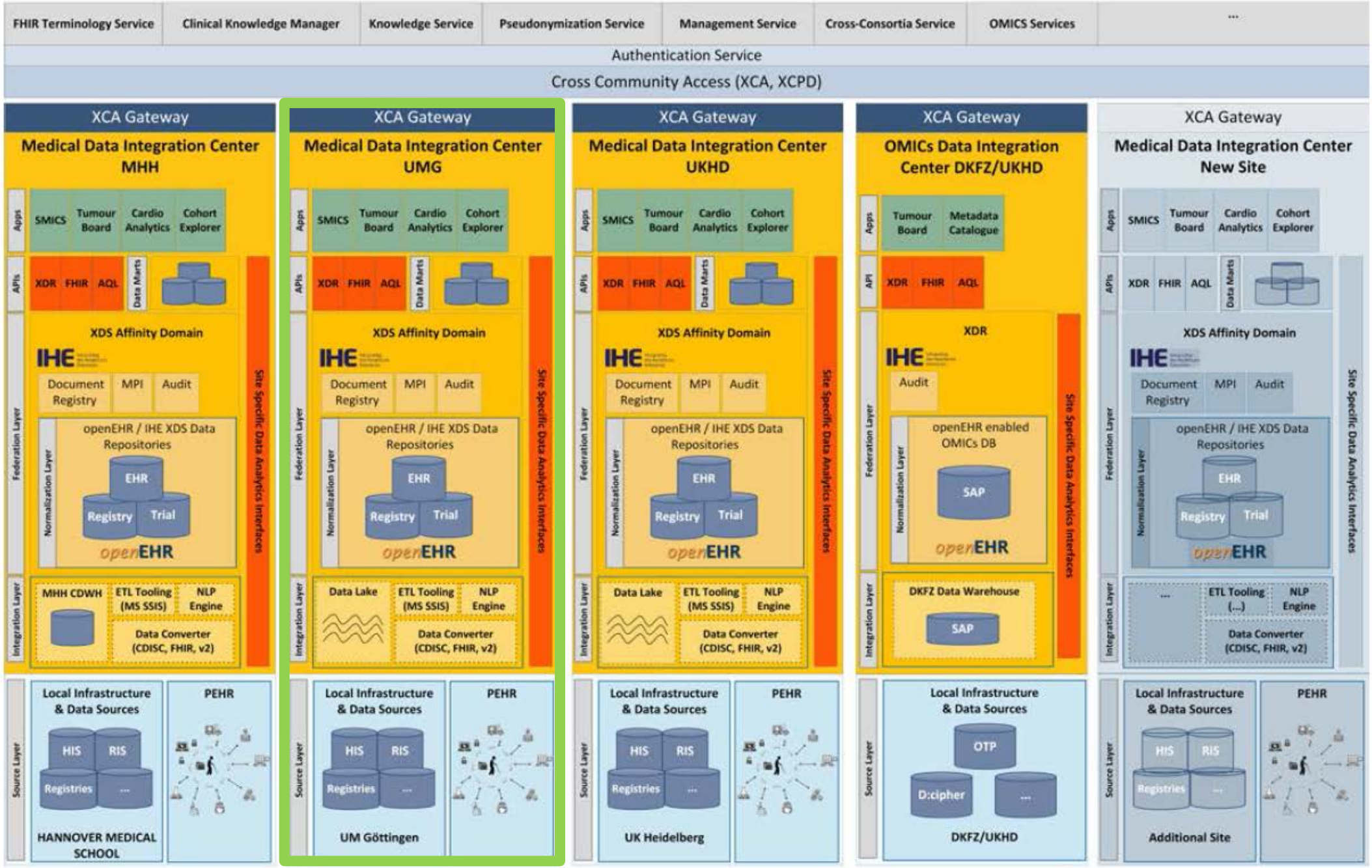
The HiGHmed Approach

HiGHmed
Medical Informatics

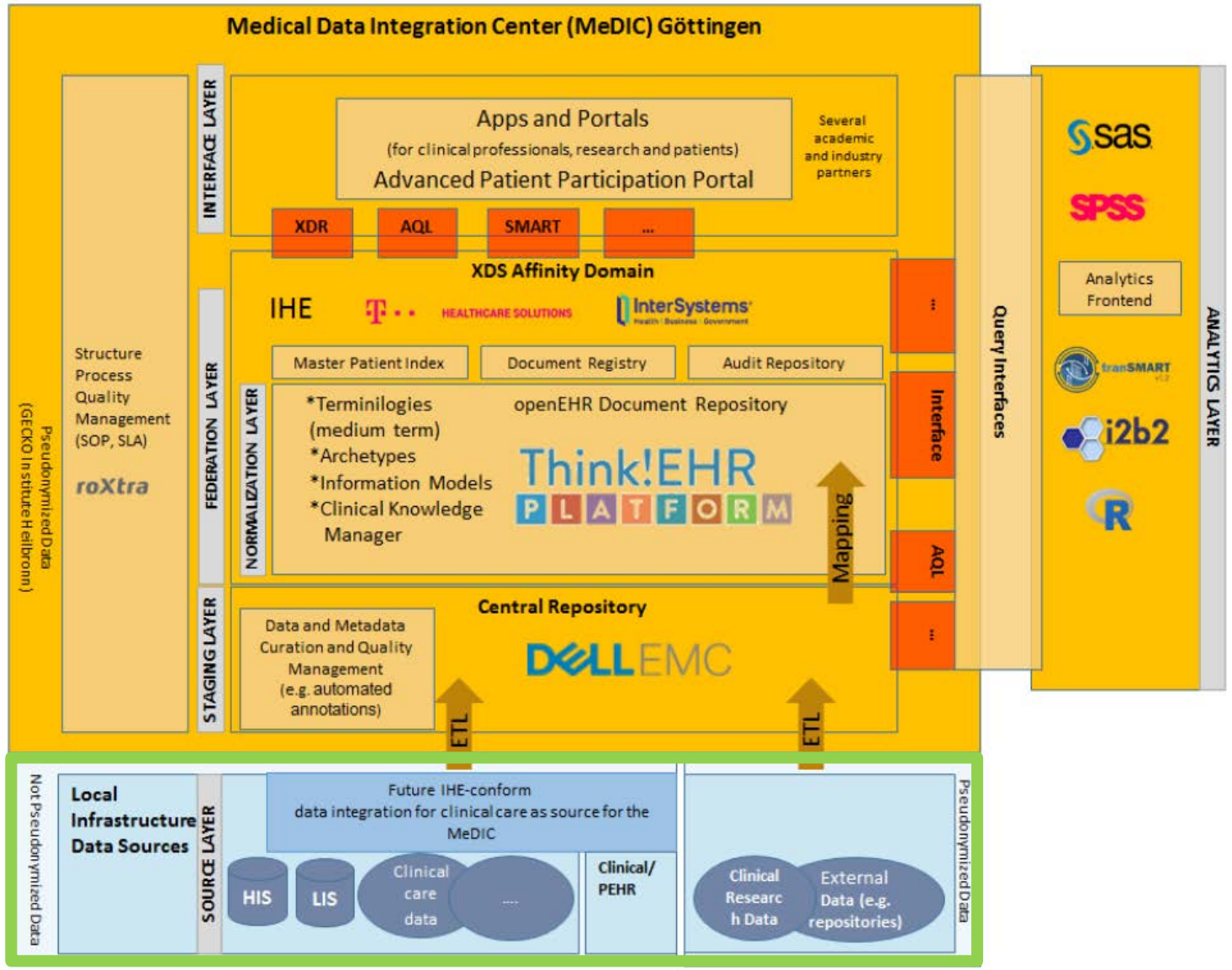
Interaction

HiGHmed Medical Informatics

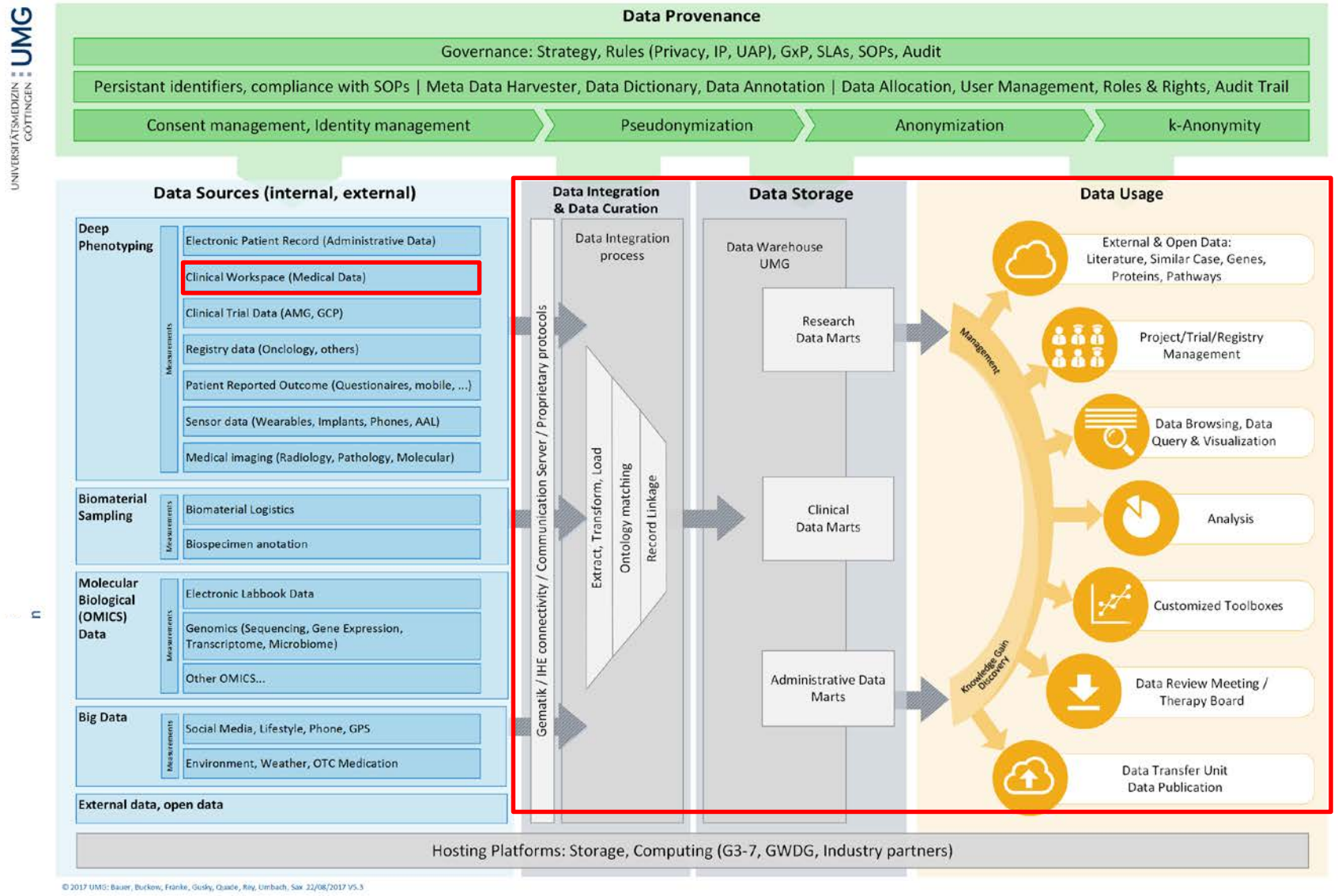
- Systematic use of open platforms following **FAIR principles**
- Permanent adoption of **national standards** (NSG) and **interaction** with other MI-consortia
- **Open standards** for health information exchange → Personal cross-Enterprise Health Record (PEHR)
- Platform for **cross-enterprise data analysis** combining openEHR and IHE XDS
- **Data scientists** and data **stewards** to work with clinicians for data structuring
- Emphasis on **patient involvement**


FHIR Terminology Service
Clinical Knowledge Manager
Knowledge Service
Pseudonymization Service
Management Service
Cross-Consortia Service
OMICS Services
...
Authentication Service
Cross Community Access (XCA, XCPD)
XCA Gateway
Medical Data Integration Center MHH
Apps
SMICS
Tumour Board
Cardio Analytics
Cohort Explorer
APIs
XDR
FHIR
AQL
Data Marts
Federation Layer
XDS Affinity Domain
IHE
Document Registry
MPI
Audit
Normalization Layer
openEHR / IHE XDS Data Repositories
EHR
Registry
Trial
openEHR
Integration Layer
MHH CDWH
ETL Tooling (MS SSIS)
NLP Engine
Data Converter (CDISC, FHIR, v2)
Site Specific Data Analytics Interfaces
Source Layer
Local Infrastructure & Data Sources
HIS
RIS
Registries
...
HANNOVER MEDICAL SCHOOL
PEHR
XCA Gateway
Medical Data Integration Center UMG
Data Lake
UM Göttingen
XCA Gateway
Medical Data Integration Center UKHD
UK Heidelberg
XCA Gateway
OMICs Data Integration Center DKFZ/UKHD
Tumour Board
Metadata Catalogue
API
Audit
openEHR enabled OMICs DB
SAP
DKFZ Data Warehouse
OTP
D:cipher
DKFZ/UKHD
XCA Gateway
Medical Data Integration Center New Site
ETL Tooling (...)
Additional Site

UMG MeDIC


Medical Data Integration Center (MeDIC) Göttingen
Pseudonymized Data (GECKO Institute Heilbronn)
Structure
Process
Quality
Management
(SOP, SLA)
roXtra
INTERFACE LAYER
FEDERATION LAYER
NORMALIZATION LAYER
STAGING LAYER
Apps and Portals
(for clinical professionals, research and patients)
Advanced Patient Participation Portal
Several academic and industry partners
XDR
AQL
SMART
...
XDS Affinity Domain
IHE
HEALTHCARE SOLUTIONS
InterSystems
Master Patient Index
Document Registry
Audit Repository
*Terminilogies (medium term)
*Archetypes
*Information Models
*Clinical Knowledge Manager
openEHR Document Repository
Think!EHR PLATFORM
Mapping
Central Repository
Data and Metadata Curation and Quality Management (e.g. automated annotations)
DELL EMC
ETL
ETL
Interface
AQL
Query Interfaces
sas
SPSS
Analytics Frontend
tranSMART
i2b2
R
ANALYTICS LAYER
Not Pseudonymized Data
Local Infrastructure Data Sources
SOURCE LAYER
Future IHE-conform data integration for clinical care as source for the MeDIC
HIS
LIS
Clinical care data
....
Clinical/ PEHR
Clinical Research Data
External Data (e.g. repositories)
Pseudonymized Data

Data management pipeline



Bauer et al, Methods of Informations in Medicine, 2016 (HEC 2016)

Introduction

- Retrospective evaluation and analysis of ICU data
  - Data from 2015/2016
  - 7000 Patients
  - 200 Million Facts
- Stored in ICCA (Philips)
  - Not easily accessible
  - No cross-patient query
  - No sorting or filtering

- Goal: Migration of ICU data into a clinical research data mart
- **Goal: make data accessible for Infection control use case of HiGHmed (MI-I, BMBF)**

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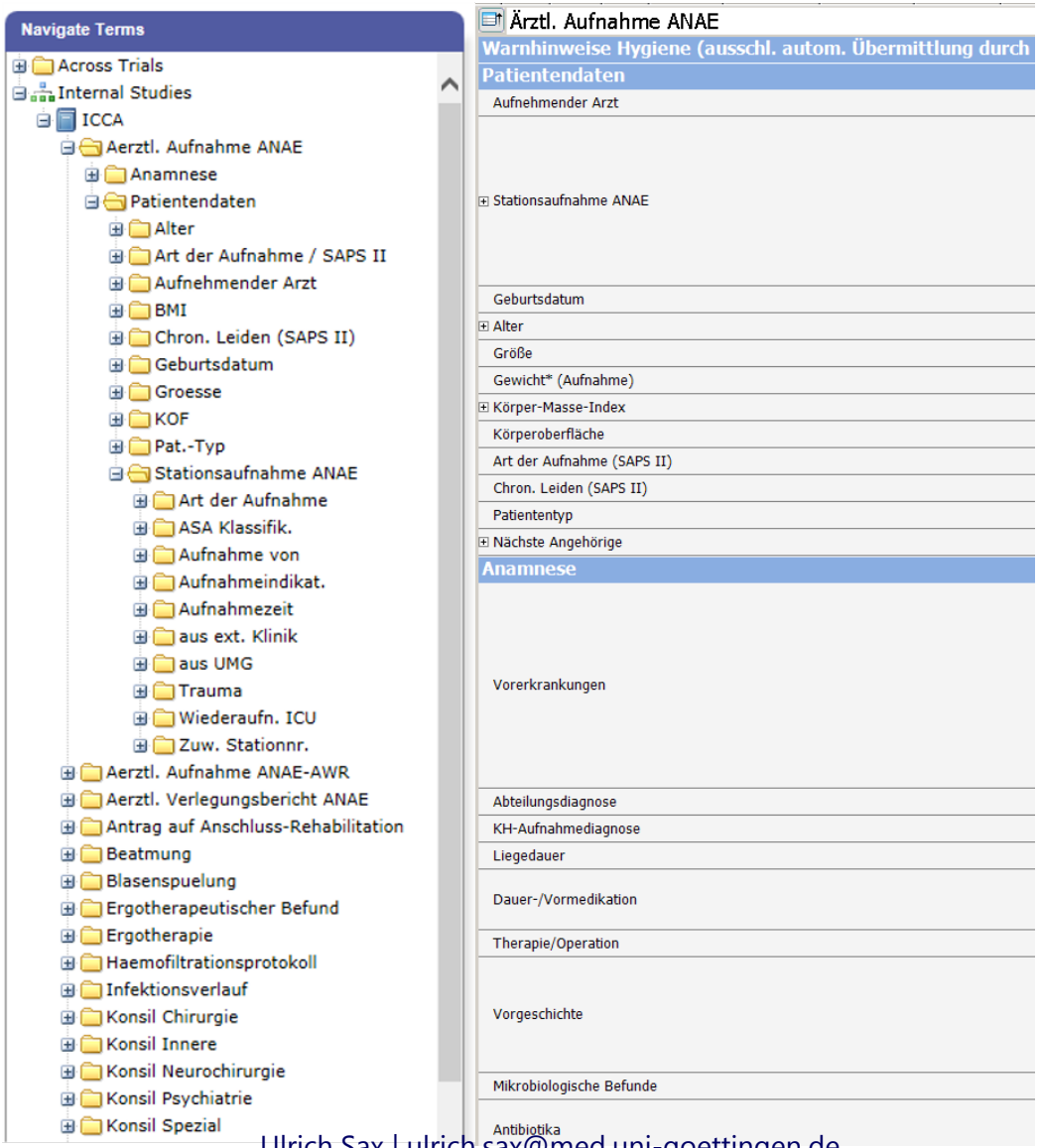
tranSMART vs. ICCA



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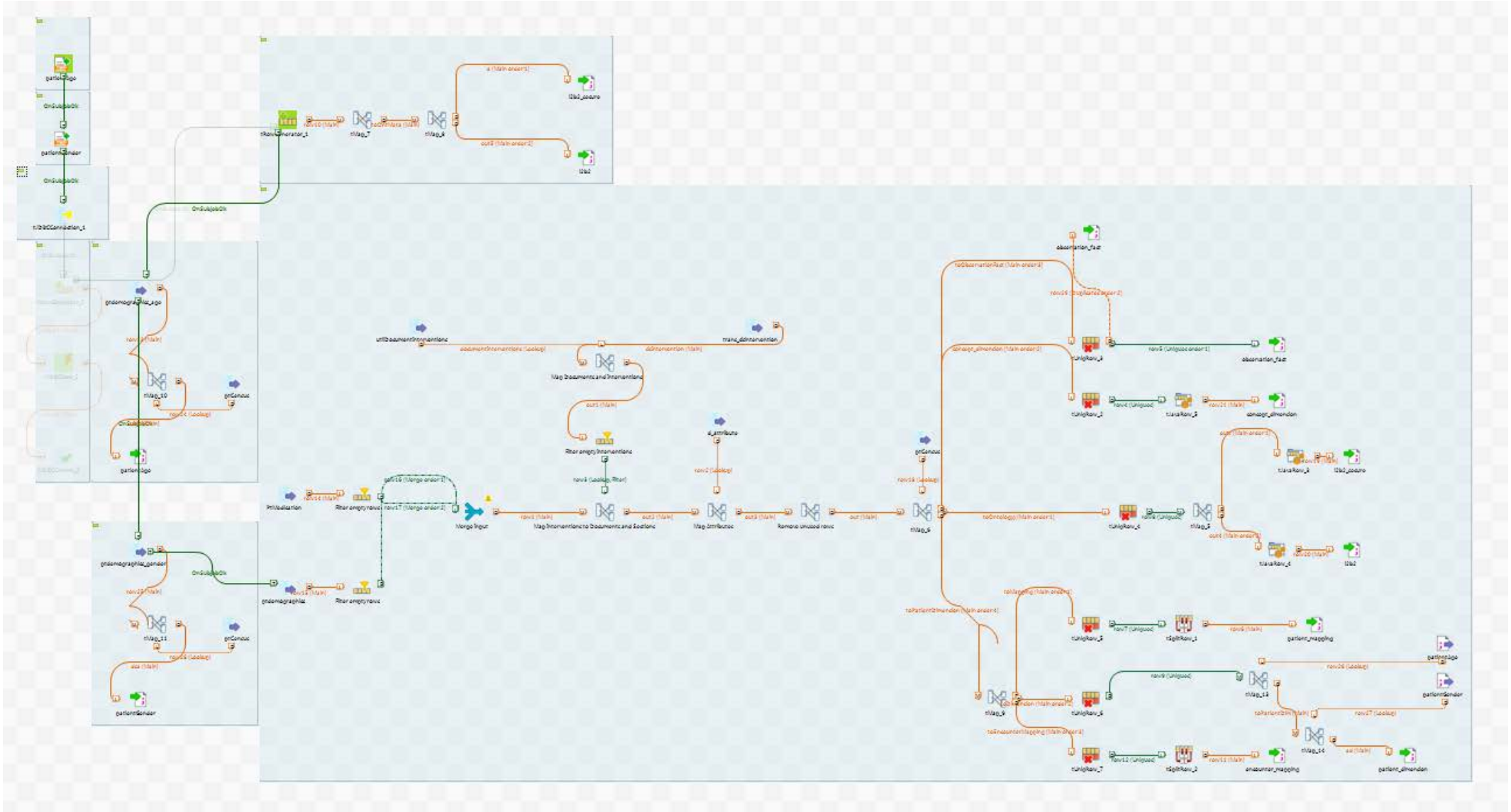
Extraction of UMG ICU data and Loading in tranSMART



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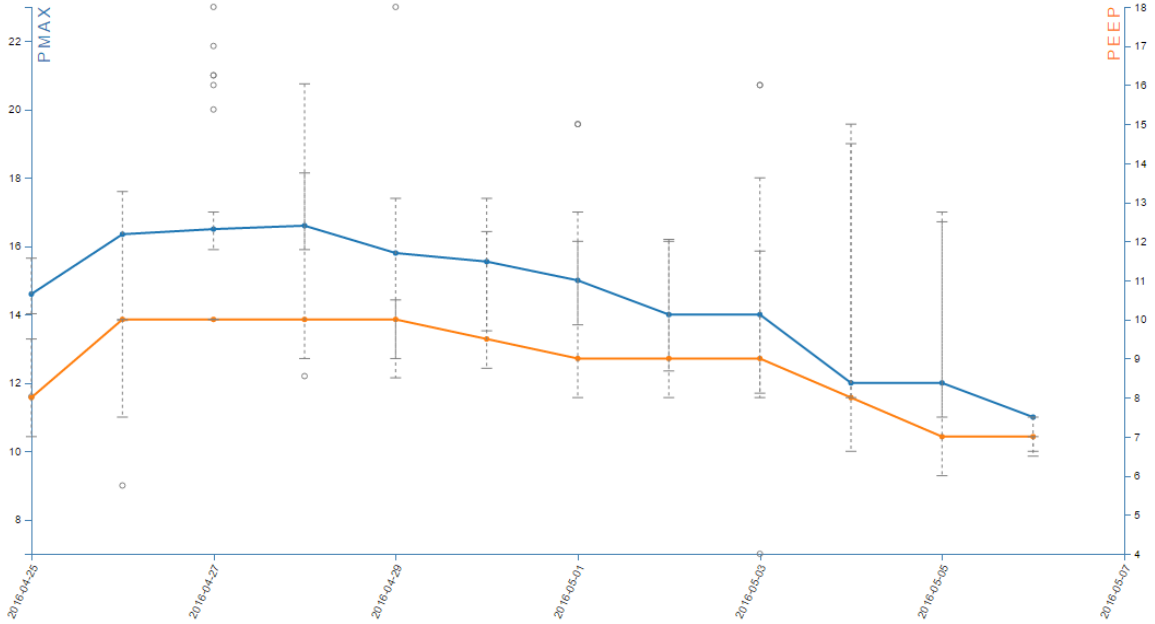
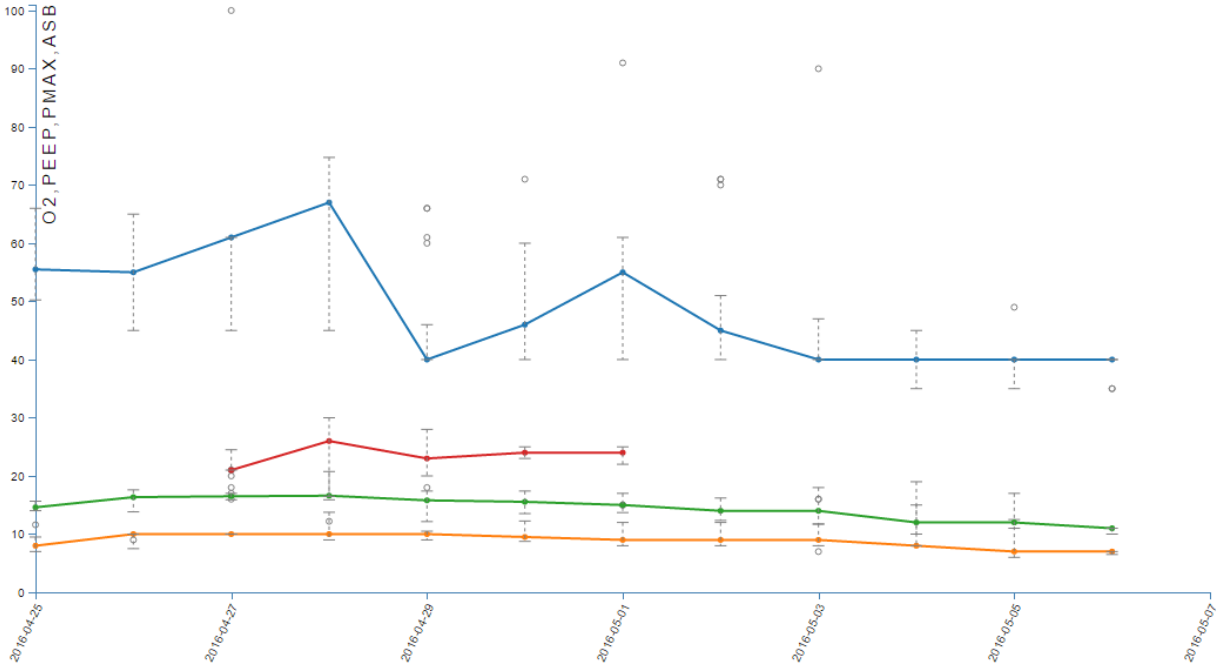
tranSMART Visualization



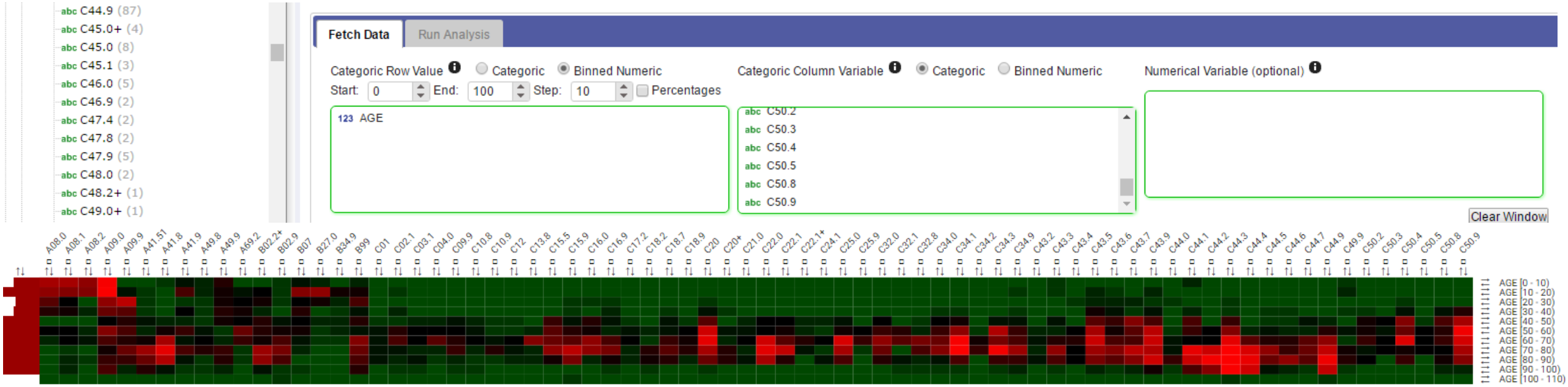
PMax PEEP



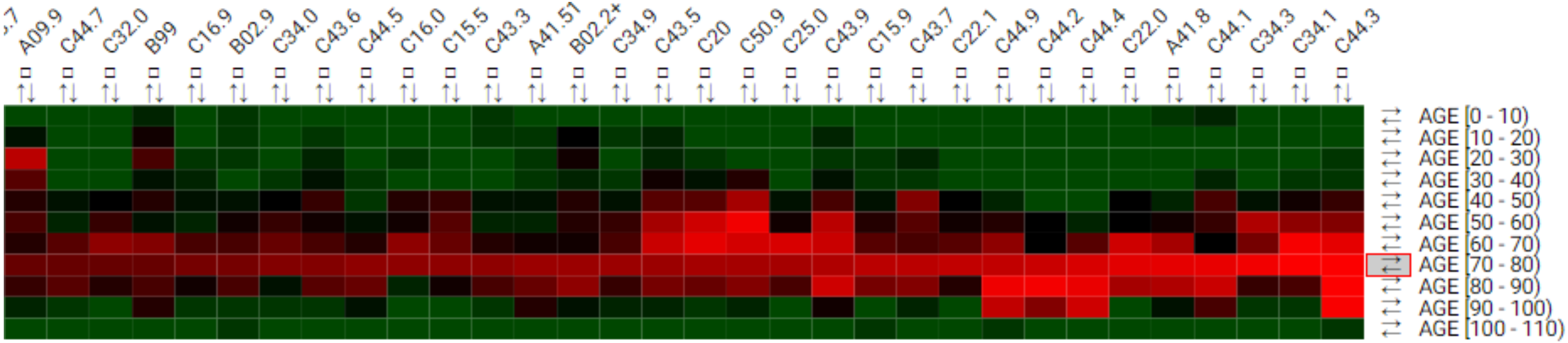
O2 PEEP PMax ASB

Ulrich Sax | ulrich.sax@med.uni-goettingen.de

- Builds a correlation between two sets of phenotype data
- Uses patient numbers or a numerical value for weighting
- Allows to quantitate numerical values into categorical ones



- Features same functionality like SmartRs genotype heatmap: **sorting**, color sets, clustering and additional information



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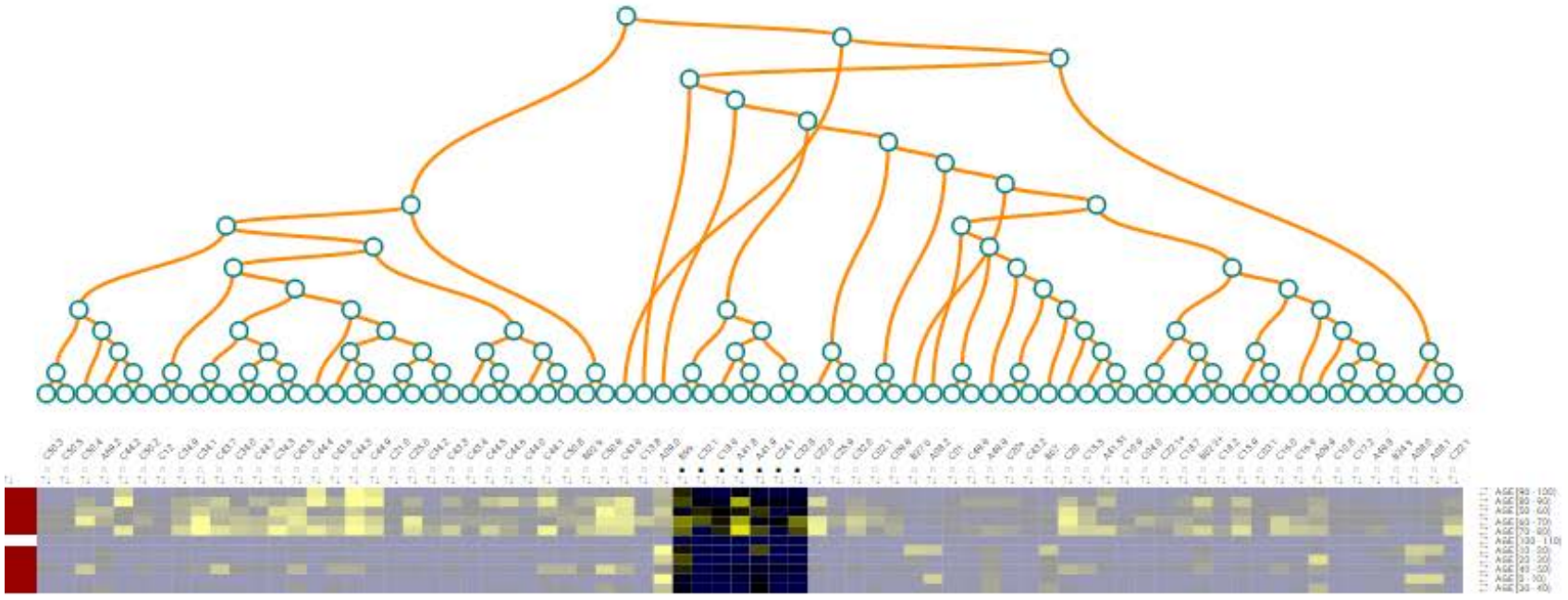

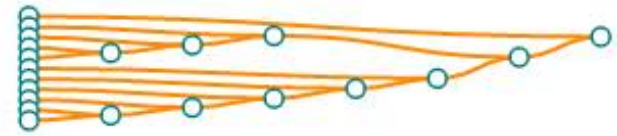

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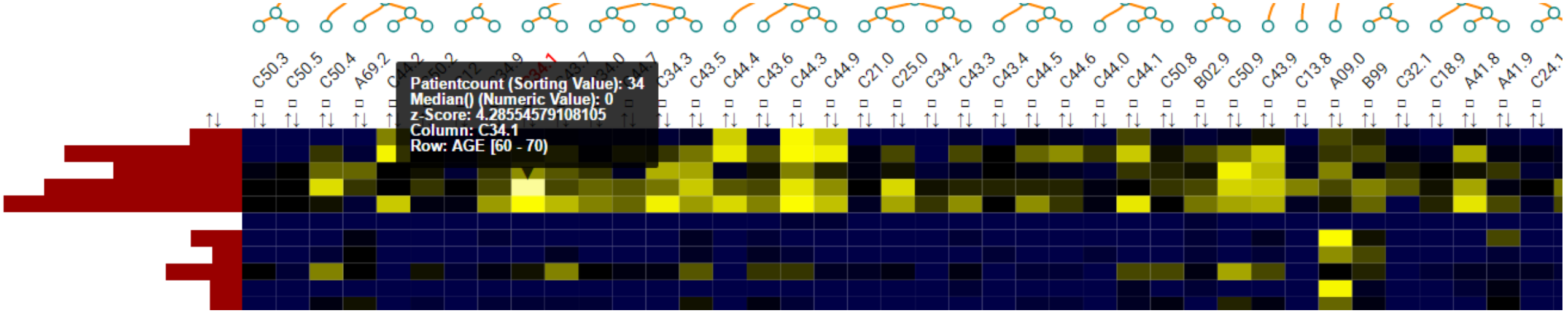

Chances and Challenges

- Data Source is a medical product
- No data dictionary, dynamic labeling (!)
- Twofold Export:
  - Structure
  - Data
- Privacy challenge (solvable)
- Data Review meetings very useful for Dialogue
- IP challenge (probably not solvable)
- Important data source for MI-Initiative meDIC

Results

- Upload of most ICU data into tranSMART database
  - database partitioning for better performance done
- Dynamic creation of tranSMART search tree by uploaded data
- tranSMART search tree complies to ICCA tabs
- Timeline data not applicable in current tranSMART
  - Grouping of timeline data by patient and enumeration during ETL
  - Example: PEEP 001 = 200, PEEP 002 = 230 for patient X
  - Therefore: Actual dates of events are not used, but comparison of patient easier
  - Repeating events (modifier) and time based queries and analysis are already solved in current i2b2 released

Outlook

- Extension of timeline visualization
  - interactive zoom, scrolling, patient selection
  - additional standard statistical visualization
- More phenotype visualizations needed
- Add additional data sources to ICU data
- Continued data review meetings
- Include more data sources for local and for HiGHmed purposes

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Retreat 2017: The Goettingen MI team grows rapidly!

Excellence

HiGHmed Medical Informatics

Associate Partners

EMC²

T · · HEALTHCARE SOLUTIONS

open EHR

HL7

Deutsche Herzstiftung

Selbsthilfebüro

Private and Networking Partners

sana

Ada Health

Academic Partners

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HPI Hasso Plattner Institut
IT Systems Engineering | Universität Potsdam

HELMHOLTZ ZENTRUM FÜR INFEKTIONSFORSCHUNG

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MEDIZIN INFORMATIK INITIATIVE

Technische Universität Braunschweig

HOCHSCHULE HANNOVER
UNIVERSITY OF APPLIED SCIENCES AND ARTS

HHN Hochschule Heilbronn
TECHNIK WIRTSCHAFT INFORMATIK

HAWK

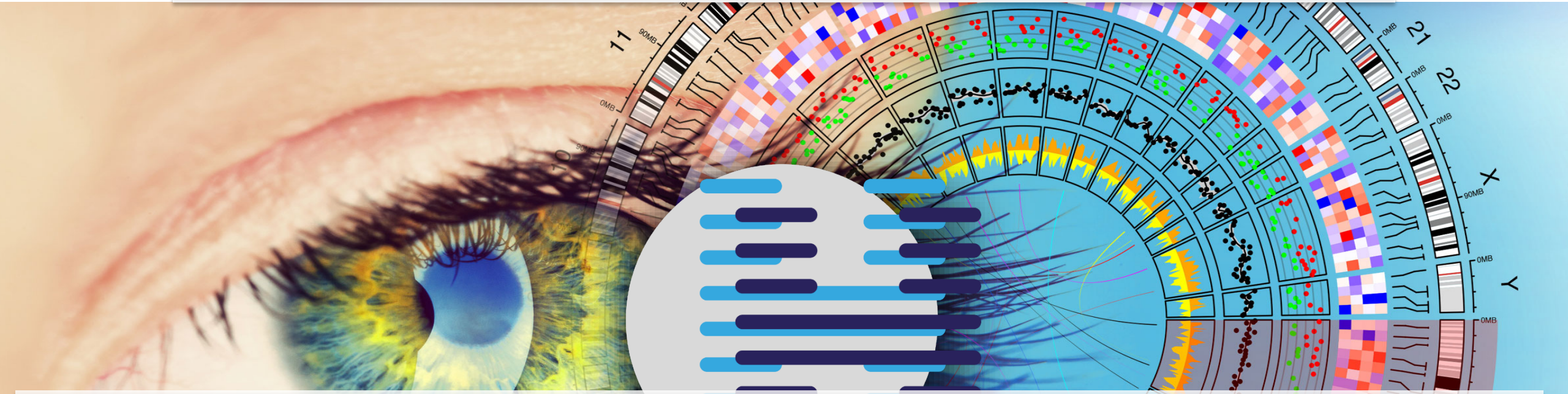
icw

SAP

NEC

SIEMENS Healthineers

HiGHmed
Medical Informatics



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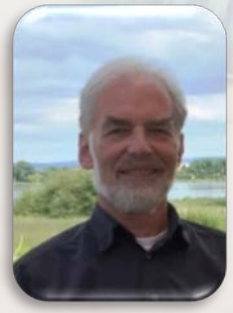
Thank you...

HiGHmed Medical Informatics

Roland Eils
Clinical Genomics

Björn Bergh
Clinical Information Systems

Michael Marschollek
Sensors and Interoperability



Otto Rienhoff
Collaborative Clinical Research

Ramin Yahyapour
Data Management and Analytics

Medizinische Fakultät Heidelberg

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