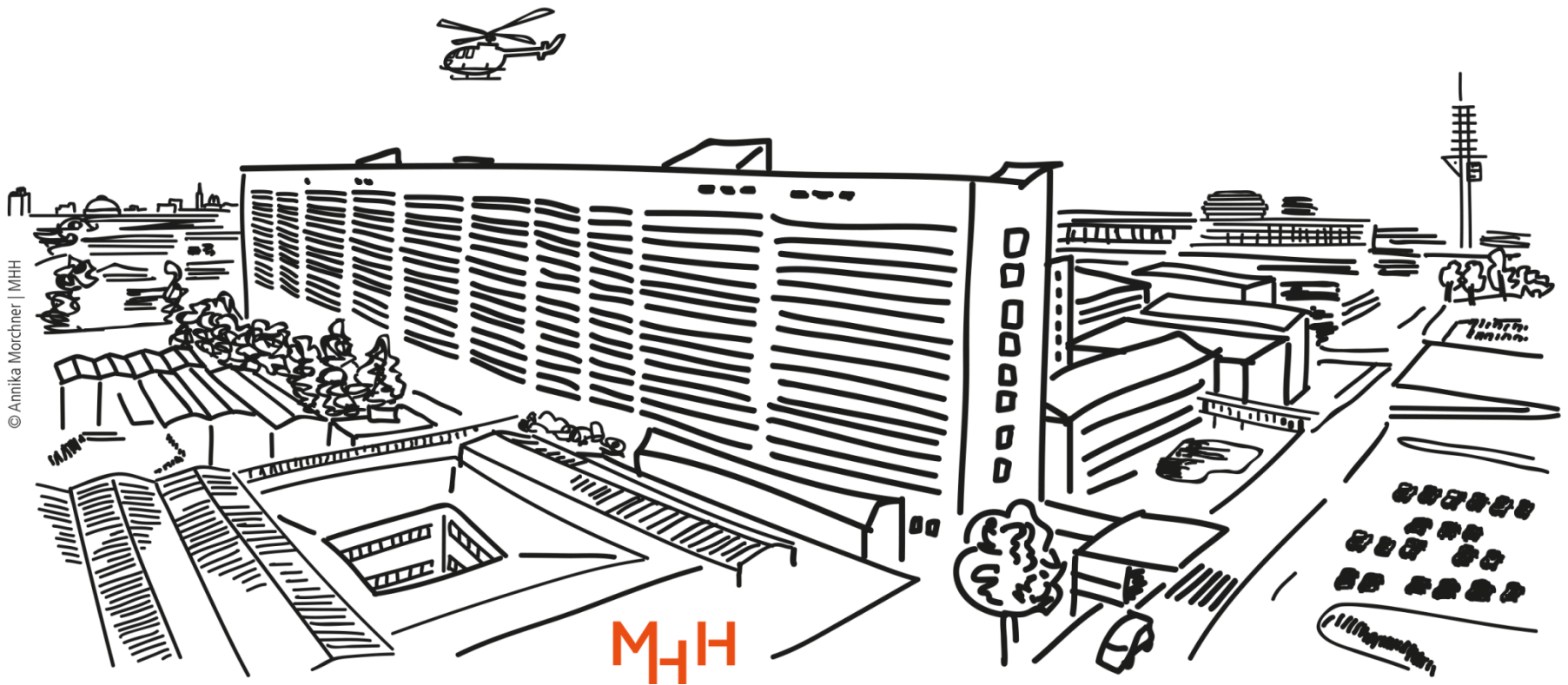# Management of bio sample related data in the oncological context of the Hannover Medical School (MHH)

Markus Kersting
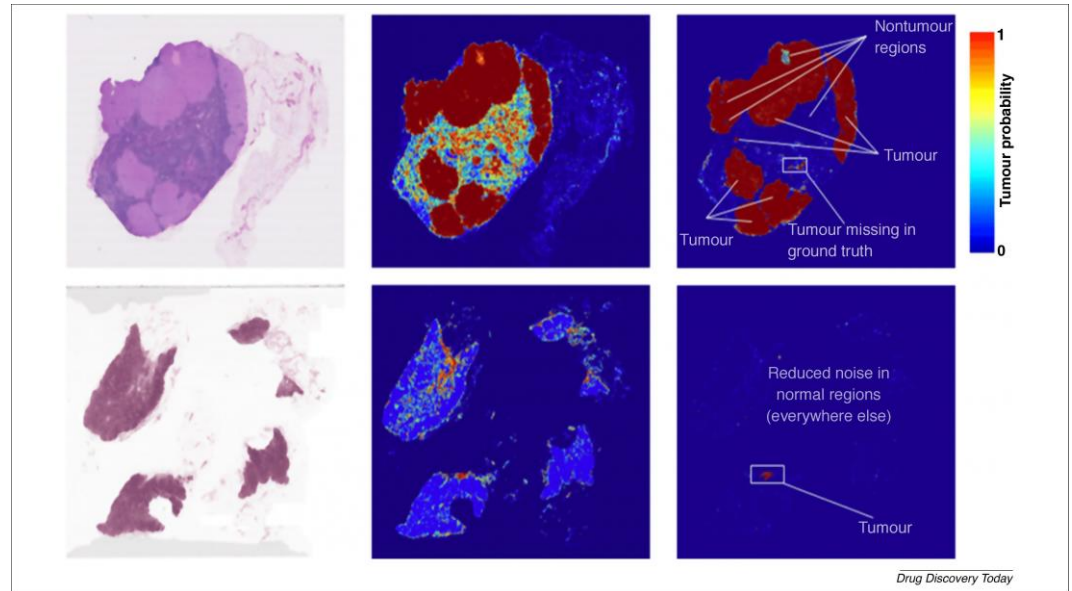
8. Nationales Biobanken-Symposium Berlin, 04.12.2019

© Annika Morchner | MHH

MHH
Hannover Medical School

What's ahead?

- Motivation

- Goal

- Big picture

- Conclusion

Google's deep learning tumor prediction heat map
https://emerj.com/ai-sector-overviews/deep-learning-in-oncology/

CCCN
Comprehensive Cancer Center Niedersachsen (lower saxony)

- 2 main sites
  - Universitätsmedizin Göttingen (UMG) and
  - Medizinische Hochschule Hannover (MHH)
- 30.000 oncological patients per year
- 12 accociated partners (hospitals)
- 8 million people (habitants) in supply area
- About 1.600 patients in clinical studies in 2018
- About 500 scientifc papers in oncology in 2018
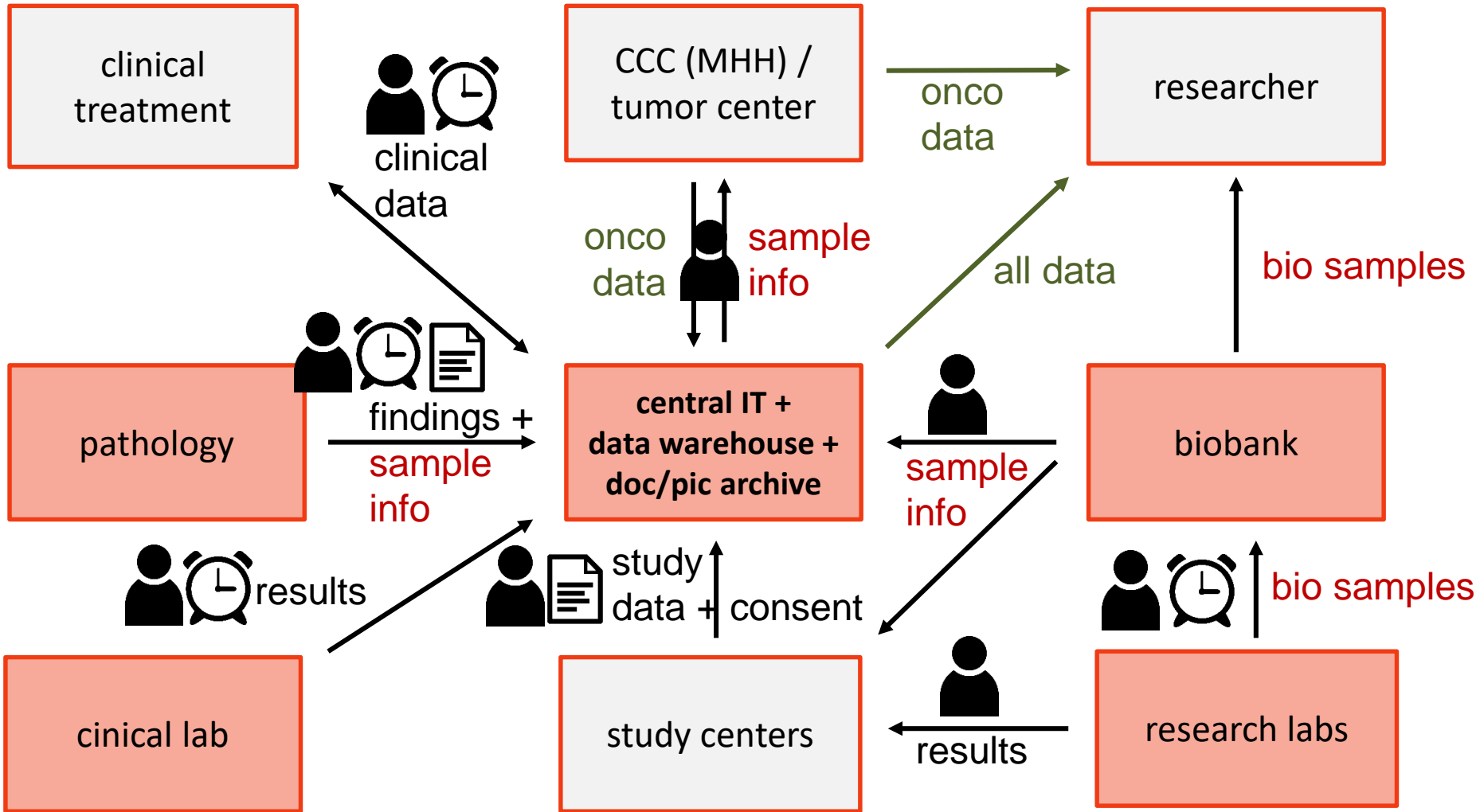
>>> Central biobank needed for application

motivation

★ ★ ★ ★ ★
WORLD'S BEST
HOSPITALS
2019
Newsweek
Powered by statista
MEDIZINISCHE
HOCHSCHULE
HANNOVER (MHH)

G⊙AL

Management of all oncological data linked to bio samples at the MHH

- Short term
  - Get it up & running
  - Meet CCC application requirements
- Long term
  - **F** indable: Google can do that for us later
  - **A** ccesible: We can do that if we WANT
  - **I** nteroperable: 🙄 … MHH first!
  - **R** e-use: let's try this first!
    Avoid redundance and double data entry, e. g. one time capture of TNM state!

stakeholder, units & data (inhouse only)

clinical treatment

clinical data

CCC (MHH) / tumor center

onco data

researcher

onco data — sample info

all data

bio samples

pathology

findings + sample info

central IT + data warehouse + doc/pic archive

sample info

biobank

results

study data + consent

sample info

bio samples

cinical lab

study centers

results

research labs

📄 unstructured   ⏰ time-critical   👤 patient scope

M₁H Hannover Medical School

Findings & Conclusions

- **Central IT coordination is essential**
- **Agile IT change management is needed**
- CCC is an **additional IT context** (compared to existing „clinic, administration & research")
  > **responsibilities have to be clarified**
- Minimal **data set for bio samples to deploy**
  via data warehouse & communiction server
  - Patient-ID, collection date, sample type, sample location (top level)
- **Structured findings in pathology** needed (e.g. coded TNM, ICD-O etc.)
- **Structured findings can be deployed using existing HL7** (Health Level 7)
  infrastrcture e.g. using encapsulated FHIR (Fast Healthcare Interoperability Resources)
- 3 data dimensions can help **categorizing data use cases**:
  - **Patient scope vs. global scope** (across projects, clinics …)
  - **Time horizon** for data access (short/critical or not)
  - **Structured** vs. **unstructured data**
- In the long run **EVERY data is research data**

What's next?

- CCC application
- Deploy basic bio sample storage infos via HL7/FHIR
- Establish structured e-consent deployment
- Improve central electronical study register
- Integrate all oncological data into DWH für re-use
- Harmonize with Universitätsmedizin Göttingen (UMG)
- Re-Use ONCOStar-Queries from UMG in MHH
- Re-Use (FHIR-)resources from GBA (German Biobank Alliance)

Last thought:

„**Medical research needs structured, validated data. Maybe artificial intelligence (AI) can help a lot in supporting clinicals and study personal to ease structured data capture and verification.**"

FHIR-Zangenbowle

e.g. http://fhir.germanbiobanknode.de/fhir/
CodeSystem/GbaSampleMaterialType

End