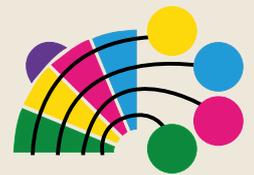


HandsOn: Biobanks

The EXPOnential relevance of biobanking.
Clinical biobanks for personalized medicine



Idea Labs
The Route
Interactive Exhibition
Plenary Sessions
Educational Session
Ethics and Science Café



MILANO,
29-31 July
2015

Website: www.handsonbiobanks.org

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WELCOME to HandsOn: Biobanks 2015

Dear Colleague,

It is our great pleasure to welcome you to the HandsOn: Biobanks 2015 meeting entitled “The EXPOnential relevance of Biobanking. Clinical Biobanks for personalized medicine”. This is the fourth HandsOn: Biobanks meeting after the excellent meeting in Helsinki organized by BBMRI.fi, together with BBMRI-ERIC and P3G. This is the second year of operation for BBMRI-ERIC, aiming to promote the collaboration of European biobanks and create a world leading infrastructure for biomedical research in Europe. Biobanking is expected to play an important role in future healthcare and BBMRI-ERIC has decided to make this conference an annual event.

HandsOn: Biobanks (HOBB) is the annual event of BBMRI-ERIC (Biobanking and BioMolecular resources Research Infrastructure – European Research Infrastructure Consortium) a pan-European research infrastructure which provides access to quality controlled human biological samples, such as blood, tissues, cells or DNA, and associated clinical and research data. According to the latest evaluation of research infrastructures of the ESFRI roadmap, BBMRI-ERIC is one of the leading European infrastructures. The strong Member State engagement already achieved in its preparatory phase makes BBMRI-ERIC an important infrastructure to further develop the European Research Area and to achieve the strategic R&D goals of Europe. This is the second year of operation for BBMRI-ERIC, aiming to promote the collaboration of European biobanks and create a world leading infrastructure for biomedical research in Europe. Biobanking is expected to play an important role in future healthcare and BBMRI-ERIC has decided to make HOBB conference an annual event.

The conference is hosted by the University Milan-Bicocca, one of the most prestigious Italian institutions with the Opening Ceremony planned in Expo at EUROPEAN UNION PAVILION, thanks to partnership with the European Commission and the University for Expo Scientific Committee.

HandsOn: Biobanks 2015 will discuss the growing relevance of clinical biobanks, essential infrastructure for the development of personalized medicine. The program includes sessions on quality in all aspects of the biobanking process, pre-analytical conditions, international outreach, partnership between academia and industry. The scientific program covers the major topics with plenary and parallel sessions; keynote lectures; posters; ethics café discussions and interactive idea labs. Also, with the help of our sponsors, the participants will follow “The Route”, an interactive exhibition where practical aspects of collection, storage and use of liquid biopsies and archive tissues will be presented.

The event will be a chance for people from all over the world to share ideas and to build on international collaborations. The audience will represent academia, industry, medical doctors, patient groups, policy makers, public representatives and legislators to discuss the future issues for biobanking. The HOBB conference will be a part of the Work Programme for BBMRI-ERIC for years to come.

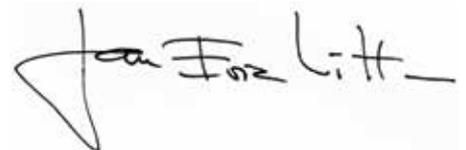
We want to thank the co-organizers, local organizers, all speakers, sponsors and exhibitors who made this conference possible. Last but not least we want to thank the conference participants showing great interest in biobanking.

We warmly welcome you to Milano and HandsOn: Biobanks 2015.

Marialuisa Lavitrano
BBMRI.it National Coordinator



Jan-Eric Litton
Director General BBMRI-ERIC



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- Long term stable nucleic acids


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POSTER SESSIONS - ABSTRACTS

17. ONLINE PORTALS: AN EFFICIENT WAY TO PROMOTE BIOBANKS?

Petra Story⁽¹⁾ - **Berthold Huppertz**⁽¹⁾ - **Karine Sargsyan**⁽¹⁾

Biobank Graz, Medical University of Graz, Graz, Austria⁽¹⁾

It is crucial for biobanks to be renowned in the research-community. Therefore, online portals may be a reasonable source for promotion. Recently an increasing number of portals with varying scope has been set-up. As a consequence, a lot of different data sets need to be collected, entered, constantly maintained and updated. The question arises: Are online portals an efficient way for biobanks to get an optimum of awareness within the research-community?

Currently, Biobank Graz pursues a combination of various public-relation activities addressed to the research-community:

publishing scientific articles

- road shows
- face-to-face meetings
- participating in exhibitions and congresses
- guided tours through Biobank Graz facilities

Additionally, Biobank Graz presents its services online at various online portals, such as corefacility.net, bbmri-eric.eu, bbmri.at, portal.meril.com, irlocator.isber.org, esbb.org.

After one year of presence in 6 portals not a single project request or cooperation with Biobank Graz was initiated from the presence in the numerous online portals. More than 300 projects are based on personal contact. Taken together, our experience of one year shows that the unfocused strategy with various portals is not the key to greatest awareness within the research-community. **Personal communication, meetings, road shows and congresses are more productive.** Even though so far the effort in online portals is not worth the outcome, biobanks should not decline them, since communication channels are changing rapidly.

Since several online-portals are developing in parallel with similar content, a joint approach for online presence of research-infrastructure is desirable to avoid inefficiency and outdated information.

18. REASONS TO USE QUALITY STANDARDS IN BIOBANKING

Thomas Insam⁽¹⁾ - **Sabrina Neururer**⁽¹⁾ - **Heidelinde Fiegl**⁽²⁾ - **Georg Göbel**⁽¹⁾

Department of Medical Statistics, Informatics and Health Economics, Medical University of Innsbruck, Innsbruck, Austria⁽¹⁾ - *Department of Obstetrics and Gynaecology, Medical University of Innsbruck, Innsbruck, Austria*⁽²⁾

Background: The Medical University of Innsbruck (MUI) intends to establish a common biobanking infrastructure in the future. This paper aims to present the current state of two cutting-edge gynaecological biosample-collections and their compliance with international standards.

Methods: The collections hosted by the Department of Obstetrics and Gynaecology were analysed in order to assess standards concerning the pre-analytical procedures, sample management and storage including related clinical data. The analysis was performed in-line with the Austrian BBMRI strategy.

Results: The biobank consists of a serum and a tissue-collection. Standard operating procedures (SOPs) according to ISO 9001:2008 have been established to guarantee high sample quality and compliance with international biobanking standards and the Austrian data protection law. Linked with available clinical data the collections provide foundation for research concerning knowledge on diseases and of new diagnostic procedures, medication and therapies. SOPs concerning the processes outside as well as inside the biobank laboratory were identified. Processes outside the lab comprised the collection of samples, pre-processing and transportation. Regulations regarding the sample reception, processing, storage, and retrieval constitute the inside laboratory quality standards. The collections contain almost 300,000 serum-samples (pre-therapeutic samples and samples drawn during the follow-up period), and more than 6,000 tissue-samples. The research output includes 113 scientific papers (2002-2014, 668 IF-points).

Discussion: Quality assurance and compliance with international standards is a laborious but promising task for biobanks, which enables remarkable scientific impact and international research cooperations. Upcoming standards will provide precise guidance beyond ISO 9001:2008.

19. IDENTIFYING POTENTIAL CANDIDATE ONTOLOGIES FOR THE BIOBANKING DOMAIN: A COMBINED SEMI-AUTOMATED COMPETENCY EVALUATION AND QUERY EXPANSION APPROACH

Philipp Hofer⁽¹⁾ - **Sabrina Neururer**⁽¹⁾ - **Georg Göbel**⁽¹⁾

Department of Medical Statistics, Informatics and Health Economics, Medical University of Innsbruck, Innsbruck, Austria⁽¹⁾

Background: As collections of biospecimen and biobanking information systems have become key enablers for medical research, biomedical ontologies can be used to semantically enrich information contained in biobank information systems. Nevertheless, it remains unclear, which ontologies are of potential use for the biobanking domain. Therefore, we propose a three-stage semi-automated evaluation approach which enables the identification of candidate ontologies by using a novel combination of competency evaluation and query expansion.

Methods: In Stage 1, candidate ontologies are identified by performing a literature review. In Stage 2, Competency Questions (CQs) are defined by medical/biobanking domain experts. They constitute queries, a common user directs to a biobanking ontology. Stage 3 lexically evaluates the usefulness of an ontology for the biobanking domain by assessing the coverage of the defined CQs. Stage 3 includes splitting the CQs up into tokens, stop-word removal, token normalization, automated token matching with ontology concepts / object properties / instances, synonym matching, query expansion and matching using related (higher) terms from Medical Subject Headings.

Results: We performed an evaluation of different ontologies (Informed Consent Ontology, Ontology for Biobanking, Biological Collection Ontology, and Ontology for General Medical Sciences) using with a small set of sample CQs and showed that none of them covers all sample CQs and meet all requirements of a biobanking ontology.

Discussion: Our approach allows a systematical evaluation of candidate ontology entities using query expansion (searching for higher key terms in comprehensive medical vocabularies) in order to state the usability of specific ontologies for the biobanking domain.

Identifying potential candidate ontologies for the biobanking domain: A combined semi-automated competency evaluation and query expansion approach

Hofer, P.M., Neururer, S.B., Göbel, G.

Background

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Discussion

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Semi-Automated Competency Evaluation of Bio-Ontologies

P. Hofer¹, S.B. Neururer¹, T. Insam², H. Hauffe³, Anette Zeilner⁴, G. Göbel¹

¹Department of Medical Statistics, Informatics and Health Economics, ²Department of Obstetrics and Gynaecology, ³Department of Urology, ⁴Division of Human Genetics, Medical University of Innsbruck

Background

Searching for samples across different biobanks needs a common semantic foundation. A harmonization of biobank contents might be reached via biomedical ontologies (Figure 1). Our aim is to develop an algorithm to identify biomedical ontologies which are relevant for the biobanking domain.

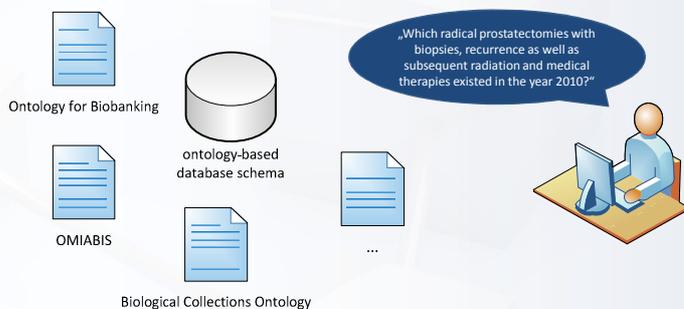


Figure 1. There are numerous biomedical ontologies that might be relevant for the biobanking domain, in order to answer user requests.

Methods

We developed a semi-automated approach (Figure 2) for the identification of semantic relationships between competency question terms and biobank ontologies using lexical-semantic relationships from other hierarchical terminologies.

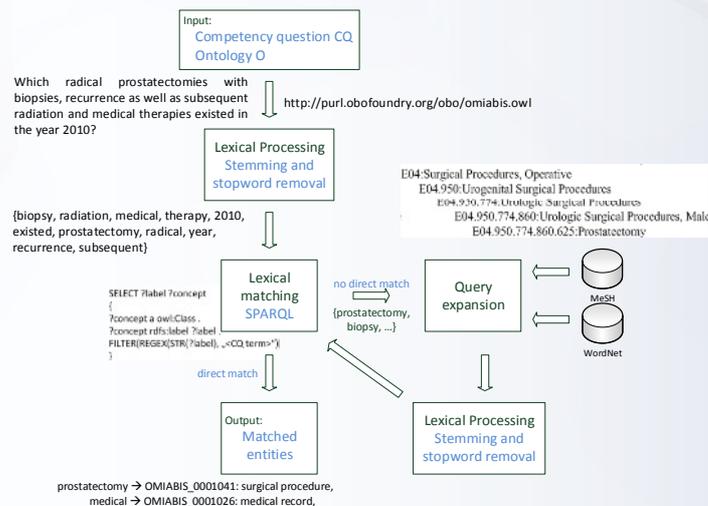


Figure 2. SPARQL queries (Jena) and query expansions (MeSH, WordNet) are performed to find semantic correspondences between competency question terms and ontology entities.

Results

We performed a proof-of-concept evaluation of the OMIABIS ontology which comprises 535 concepts and 77 object properties (22.2.2015, including imports from higher-level ontologies). Relevant entity matches were determined in collaboration with medical experts from the Department of Urology of the Medical University of Innsbruck (Table 1).

CQ Terms	Example: Relevant entity relationships (OMIABIS)
biopsy	primary diagnosis, diagnosis, sample handling, diagnostic process, surgical procedure, specimen surgical removal
radiation	treatment
medical therapy	medical record, sample medical record
2010	treatment
existed	value specification
prostatectomy	exists at, during which exists
radical	surgical procedure, specimen surgical removal
year	surgical procedure, specimen surgical removal
recurrence	date of data entry, time unit
subsequent	specimen disease state data, disease state specimen data
	-

Table 1. Relevant matches that are expected to be returned by our algorithm.

Correct and incorrect matches (Table 2) were then calculated based on the relevant matches from the previous step.

Keywords	True positive	False positive	Total matches
biopsy	3	63	66
radiation	0	1	1
medical	2	0	2
therapy	0	0	0
2010	0	0	0
existed	2	0	2
prostatectomy	2	3	5
radical	0	8	8
year	0	1	1
recurrence	2	3	5
subsequent	0	0	0

Table 2. True and false matches that are returned by our algorithm.

Discussion

Our approach allows a systematical evaluation of candidate ontology entities using query expansion (searching for higher key terms in comprehensive medical vocabularies) in order to state the usability of specific ontologies for the biobanking domain. Compound nouns are not considered in the first version of our algorithm which results in a high number of false positive matches. We plan to extend and refine the matching process towards integrating composite terms and concept relationships.

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