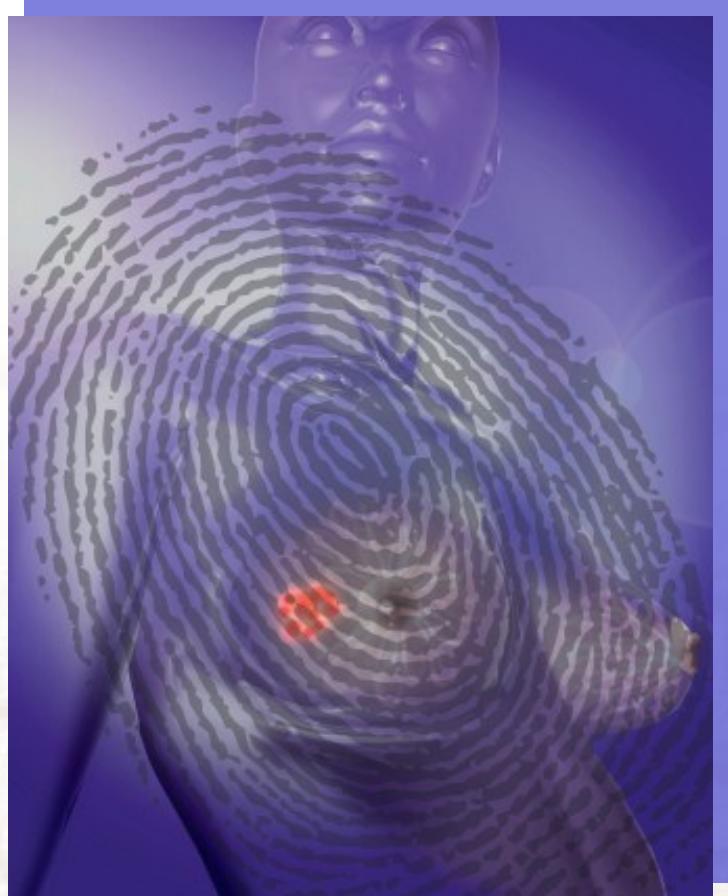


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**CREATE Health has come a long way in identifying the fingerprint of breast cancer**

Ulrika Andréasson, page 4



**About 25% of the men with "normal" PSA values do in fact have cancer. This means that we need this research**

Henrik Grönberg, STHLM2, page 8

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SAVE THE DATE

# HandsOn: Biobanks

Uppsala, 20-21 September 2012

**Welcome to an interactive conference on biobanks! Meet biobank researchers and industry, listen to interesting talks and participate in idea labs and workshops. Topics range from the latest technology through ethical challenges and legislation to outcome in clinical praxis and drug development.**

**Would you like to receive more information about this conference?**

**VISIT [bbmri.se/en/Conferences/handsonbiobanks/](http://bbmri.se/en/Conferences/handsonbiobanks/)**

## New Breakthroughs in 2012? You Can Biobank On It!

When Time magazine named Biobanking as one of the “10 Ideas Changing the World Right Now” (Park, A. Biobanks - 10 Ideas Changing the World Right Now – TIME 2009), BBMRI.se was just about to start the work on the complex task of giving Sweden a place in the changing world.

During our first 2 years of operation, we have had to address many challenges in order to improve the national biobanking infrastructure. If modern biobanks are to be effective in supporting research, a highly complex, advanced operation is required. Technical & scientific challenges and further developments of component frameworks require a large critical mass. We aim to create an open, collaborative infrastructure for scientists working with biobanks and medical data, for the advancement of scientific knowledge and health.

When implemented effectively, biobanking can harness the power of both genomic and clinical data and serve as a critical bridge between basic and applied research, linking laboratory to patient and getting cure faster.

All work packages in BBMRI.se are now launched and the infrastructure is operational. Complex challenges will remain and these are the focus of our 2012 plans. They include securing a recognized national presence in Sweden, gaining full recognition of our long-term goals and purpose, and demonstrating the interplay of the different component parts. BBMRI.se will also continue to build on

the achievements during our first 2 years, we have:

- created a highly effective large-scale sample handling process (improving speed, quality and cost)
- populated the national biobanking facility with nearly 2 million samples
- started to provide 14 national research groups or studies with biobank services
- established an early presence in all Swedish regions
- gained agreement on a common national Biobank registry
- established a unique strength in the ethics of Biobank-related research
- assembled a catalogue of advanced molecular analysis methods
- developed a national biobanking solution for clinical cytology

In the next couple of years, I think that not only does BBMRI.se have a chance of being successful but also, it has a really fantastic chance of being successful. It is my belief that 2012 will be a leap forward in the biobanking field.

I wish you all a Happy New Biobanking Year!!



## CREATE Health



CREATE Health is a Strategic Centre for Translational Cancer Research at Lund University, funded mainly by the Swedish Foundation for Strategic Research, VINNOVA, Knut and Alice Wallenberg Foundation and Lund University. The centre is unique in its kind integrating scientists from the Faculties of Medicine, Science and Engineering (LTH) with researchers and clinicians from Skåne University Hospital (SUS) in superbly equipped facilities, with advanced “omics” platforms concentrated on translational cancer research.

The research focus within CREATE Health is on biomarkers for improved diagnosis and patient stratification to enhance the quality of life/survival of patients and reduce the medical and hospital costs for society.

The aim with CREATE Health is to translate scientific discoveries into practical applications, for the benefit of the patients. One example of this is prognostication of disease progression for cancer patients. In a recent study researchers identified molecular portraits associated with breast cancer recurrence allowing risk classification of patients for developing metastatic breast cancer. This study was made possible due to access to samples from patients at time of diagnosis and longitudinally at follow ups.

Consequently, to be able to perform such research the access to well documented biological samples is crucial and is why CREATE Health strongly supports BBMRI.se. To facili-

tate the communication between BBMRI.se and cancer centers, such as CREATE Health our research coordinator, Ulrika Andréasson, is part time employed as a WP4 coworker (molecular analysis resources). The goal is to spread knowledge and research methodology for genomics and proteomics, established within CREATE Health, to a national level. Furthermore, the networks of CREATE Health will be used to build up the southern part of BBMRI.se, including the SCIBLU that offers integrated services in all main omics areas, as well as other cancer research groups and groups focusing on complex diseases, for example Lund Diabetic Centre (LUDC). In addition, the Skåne area harbors several existing biobanks, for example “Region Skåne Bio-Bank”, Malmö Kost Cancer (MKC) and Malmö Förebyggande Medicin (MFM), as well as Epi-Health that is just starting. The future connections to these biobanks are presently discussed.

The CREATE Health centre is formed by the Program Director Carl Borrebaeck (Cancer Immunology), Deputy Program Director Carsten Rose (Head of Division for oncology and hematology), the Principal Investigators Åke Borg (Oncogenomics), Peter James (Proteomics), Carsten Peterson (Bioinformatics), Thomas Laurell (Bionanotechnology), and Sven Pålman (Tumor biology), and the research coordinators Ulrika Ringdahl and Ulrika Andréasson, in total comprising 70-80 individuals.



By Ulrika Andréasson

## Workshop Report

# Towards Excellence and Standardisation in Fresh Tissue Biobanking - An International Workshop

On September 16<sup>th</sup>, a total of 40 delegates from Belgium, Finland, Holland, Norway and Sweden met up in Stockholm for a tissue biobanking workshop co-organized by the Karolinska Healthcare Research Biobank (KHRBB) and BBMRI.se. The aim of the workshop was to discuss important questions in tissue biobanking and it was attended by upper university management, surgeons, pathologists, biobankers and researchers. The day started with presentations on prominent tissue biobank topics including tissue biobank set-up, functions and service (Monica Nistér, KHRBB, James Thompson, KHRBB and Tobias Sjöblom, Uppsala University), quality control (Gunnel Tybring, KI Biobank), preservation methods (Bas De Jong, Erasmus Medical Center Biobank, Rotterdam, Holland), laboratory information management systems (LIMS) (Eva Bürén, KI Biobank), and automated tissue storage, retrieval and analysis (Kimmo Pitkänen, Institute of Molecular Medicine Finland, Helsinki, Finland).

After the presentations, the delegates were given the opportunity to join a workgroup to give their ideas on surgery to pathology logistics, sample processing, quality control, data management and national cohesion, and research activities. The presenters acted as group facilitators and enabled great discussions.

***“One of the most pressing issues emerging from the day is the need of a tissue oriented LIMS that can be widely adopted by many tissue biobanks.”***

One of the most pressing issues emerging from the day is the need of a tissue oriented LIMS that can be widely adopted by many tissue biobanks. Eva Bürén presented how the KI Biobank has been adapting it's Sample Collection, Administration, Research and Biobanking (SCARAB) LIMS for tissue banking.

The modifications are aimed at making SCARAB user friendly, quick to input multiple data points using the standard System > Organ > Tissue > Specimen dataset, and a plethora of other features such as sample location/study tracking, test results tracking and quality control information. Discussions within the workgroup revealed that the SCARAB dataset architecture can cope with the ever expanding archiving demands of the long term future and can be harmonized with other LIMS locally, nationally and internationally. SCARAB will be imminently adopted by the KHRBB and Uppsala University biobanks.

Another important area discussed was the standardization of specimen preservation, storage and retrieval. Bas De Jong gave a presentation about tissue preservation methods and revealed that at the Erasmus Medical Center Biobank they use the technique of freezing all biobank samples on to cork bases via saline soaked filter paper so that the sample doesn't have to come into contact with mounting media such as OCT, that may inter-

## Workshop Report

ferre with downstream analysis such as mass spectrometry. The importance of routine histopathological review of specimens was also stressed so that the biobank could verify the features of each sample it manages. In addition, they have investigated alternatives to formaldehyde for tissue fixation. In a forthcoming publication they will reveal promising results from using non-formaldehyde fixatives that do not cross-link DNA and RNA and yet retain sample stability at room temperature. Kimmo Pitkänen reviewed the feasibility to use automated storage and retrieval systems in tissue biobanking to fit downstream high throughput assay formats for analysis. Due to the non-uniform sizes of tissue samples (unlike population biobanking), there is currently not an optimal all encompassing system and therefore the choices are limited



At the tissue workshop

and difficult. The workgroup also revealed how different people's opinions are on best tissue preservation practices. It was concluded that to standardize tissue preservation, tolerances rather than absolute guidelines should be implemented. This is definitely an area of continued global discussion.

Gunnel Tybring gave a presentation on quality control and revealed that currently

there is no absolute measure of tissue sample quality. The most common method used is RNA integrity number (RIN) values or in some cases targeted PCR. The workgroup discussions were fruitful and produced a list of suggestions for where quality control should be applied including time and temperature stamping of samples from the surgery to the freezer, noting tissue sizes and ensuring that control material is processed with the same standard operation procedures. Additionally, each sample should be accompanied by a pre-

***"The workgroup suggested that collaborative studies aiming at defining best practices are initiated and all results should be communicated via networks such as BBMRI."***

defined sample collection form, signed at each step in the process chain and any deviations in the way the sample was processed must be reported. Finally, responding to feedback from end users was considered an important step to ensure sample quality. The workgroup suggested that collaborative studies aiming at defining best practices are initiated and all results should be communicated via networks such as BBMRI. Similar discussions and conclusions on best practices of surgery to pathology logistics were presented by the group facilitated by Monica Nistér. There was a discussion on the importance of making the surgery to pathology logistics as structured and as streamlined as possible.

Biobank set-up, functions and service was highlighted by Tobias Sjöblom presenting the

## Workshop Report

U-CAN collaborative effort underlining the benefits of centralized tissue biobanking linked to defined clinical follow-up. The importance of establishing communication channels between the different clinical departments and optimizing all work flows so that they have minimum impact on the daily routines of surgery and pathology was emphasized. To support the research potential of the biobanked high-value but limited samples, biobanks also need to have access to well-equipped laboratories with the latest technologies. Such facilities are also being established at the KHRBB as presented by

***“It was concluded that to standardize tissue preservation, tolerances rather than absolute guidelines should be implemented.”***

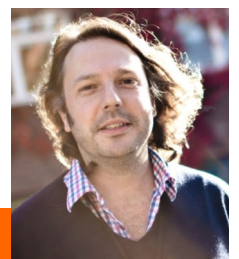
James Thompson. The workgroup discussions suggested the primary task of a research biobank was to collect and provide well characterized, high quality samples to users for downstream analysis applications.

Additionally, biobanks should investigate the possibility to process fresh samples such as routinely establishing cell lines from patient materials.

The workshop brought to light that there are still many issues to be resolved before standardization can be established in tissue biobanking. It was also stated that tissues and project requirements differ to such a high degree that flexibility in agreed procedures will be an essential part of successful tissue biobanking. However, it is comforting to know all tissue biobanks are facing the same problems and unanswered questions. It was a productive and enjoyable day and we would like to thank all the participants for making it such a successful event.

The principal organizers James Thompson and Monica Nistér would like to personally thank co-organizers Joakim Dillner (BBMRI.se), Sofie Petersson (BBMRI.se) and Gregory Winn (KHRBB) for excellent administrative support and contributions and Christina Von Gertten (Eurocan Platform) for taking minutes. A PDF of the lectures will be available at the KHRBB and BBMRI.se websites.

By James Thompson



## STHLM 2

Stora prostata-cancerstudien:

### STHLM 2

STHLM2 is the largest research project in Sweden about prostate cancer and is a collaboration between Karolinska Institutet and Karolinska University Hospital. The aim is to find how heredity, environment and genetic changes can be used to predict the risk of developing prostate cancer. The goal is to develop better diagnosis and treatment.

Henrik Grönberg, Professor of Cancer Epidemiology, is the PI for STHLM2. He tells me that what is so unique with this project is the amount of samples they are able to collect. All men who are visiting an physician and take a prostate specific antigen (PSA) test or is diagnosed with prostate cancer in the Stockholm health care system are invited to participate in the study, during the period of the project (STHLM2 is running for two years; 2011 and 2012). The men participating in the study (approx. 40 000 individuals) contribute with samples of DNA, plasma and urine and are also asked to fill out a web questionnaire about life style factors. The collected material and data is not only valuable for cancer research but also for other research fields such as cardiovascular diseases.

The project has been running for almost one year now and Henrik is looking forward to the first results by the summer of 2012. In one of the studies PhD students will look at PSA samples and perform genetic analyses. They will also look at biomarkers and compare those that have developed cancer to those that haven't. Today we know that almost 60-70% of all new prostate cancer cases

in Sweden are detected by PSA tests. PSA testing is a method with poor specificity, which means that a large proportion of men with an increased PSA value are undergoing investigations without cancer being detected. Meanwhile, about 25% of the men with "normal" PSA values (PSA <3ng/ml) do in fact have cancer. This means that we need this research in order to find more specific methods for detecting prostate cancer.

Henrik finds the collaboration between STHLM2 and BBMRI.se crucial, and he considers the infrastructure to be important for this kind of large-scale study. Through BBMRI.se all the samples can be handled fast and efficient with a standardized high quality. Henrik hopes that all other medical universities in Sweden will be joining BBMRI.se, and that all researchers will see the benefits of this type of infrastructure. STHLM2 is funded by Vetenskapsrådet, The Linnécenter, CRISP, Cancerfonden, Söderbergs stiftelser and National Institutes of Health.

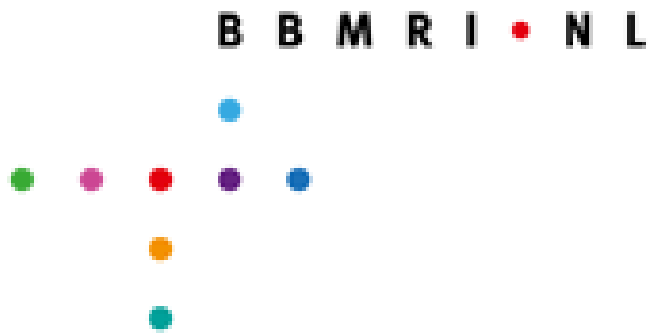
The next step for the prostate cancer project is already taken, with the new project STHLM3 starting in January 2013. The aim of STHLM3 is a systemized prostate cancer testing for all men within the age range of 50-69 in the Stockholm area, approx. 260 000 men will be invited. STHLM3 is funded by the Stockholm County Council.



*Henrik Grönberg*



## The BBMRI.nl Annual Biobanking Conference



On the 21<sup>st</sup> of November 2011, BBMRI.nl held its second annual biobanking conference in Rotterdam. This was the second BBMRI.nl international biobanking conference, after the official BBMRI.nl launch conference which was held in 2010.

BBMRI.nl is so far the largest national BBMRI platform to be launched, with a grant from the Dutch Organisation for Scientific Research of 22.5 million Euros to 2012. BBMRI.nl is organised in several large-scale “Rainbow projects”, that primarily serve to enrich and harmonise existing biobanks, and

over forty small-scale “Complementation projects” in research on biobanking.

The conference offered a diverse program, with several international lecturers in the field of biobanking and pharmacogenomics. The Rainbow projects were presented in lectures and the Complementation projects on posters, with an amazing width in scope and content.

As the introductory international lecture of the conference, I had the honor to present the progress of BBMRI.se. The audience showed an enormous interest in BBMRI.se, with lots of questions on how we had managed to get as far as we have. The Nordic health data registry infrastructure and the BBMRI Nordic initiative also raised significant attention. The conference had over 300 attendants from many countries and it was a highly stimulating experience to meet so many scientists this devoted to the science of building and exploiting the biobanking infrastructure.



By Joakim Dillner

## Work Package Report (Clinical Biobanks)

# National planning for biobanking within clinical cytology

The mission of the BBMRI.se Clinical Biobanks work package (WP3) is to establish a nationwide expansion and standardisation of patient-related and laboratory medicine biobanking.

Currently WP3 has presented a plan for a standardised and quality checked biobanking within the gynecological cell sample program in Sweden.



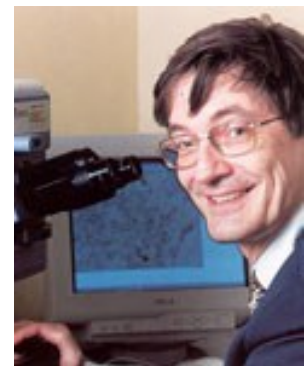
Nasrin Perskvist at the cytology biobank

At a national hearing and demonstration on October 26<sup>th</sup> of the BBMRI.se pilot system for automated biobanking of gynecological cell samples, representatives from 12 county councils participated - 76 persons in total.

The hearing began with three lectures. Joakim Dillner presented the BBMRI.se-

concept of acquiring a national standardisation, and of economising and avoiding double work by developing national biobank solutions - available to co-operative laboratory medical clinics by means of large-scale national procurements.

Professor Anders Hjerpe reported on the need of collecting the samples for the purpose of clinical diagnostics. Nasrin



Anders Hjerpe

Perskvist presented the results so far for a national biobank solution within clinical cytology. This includes automation, usability and exchange of samples, quality assurance as well as an IT-solution and storage in an automatable BBMRI-format which has been tested at Karolinska Universitetslaboratoriet.

After a tour of the biobank, a discussion ensued. Many representatives showed interest in the national concept of BBMRI.se, and we formed a national network for the standardisation of biobanking within clinical cytology. The next meeting will be held at the next county council to introduce the running of the national biobank solution.



By Nasrin Perskvist

## Pharmaceutical industry perspectives on biobanking

On September 29, 2011 the Swedish Academy of Pharmaceutical Sciences arranged a seminar on Biobanking, with particular reference to the development of the biobanking field from the pharmaceutical industry perspective. The seminar had 57 attendants, representing many different companies and other stakeholders.

Presentations included the following topics and people:

Joakim Dillner started off with discussing the upcoming era of the large-scale biobanking sciences, how that will affect the industry and how BBMRI.se will be strengthening the Swedish advantages in this area.

Second speaker Mark Divers presented the amazing progress that has been made on how to turn the large-scale biobanking dream into a reality, an operational large-scale facility.

Göran Elinder reviewed the pending new biobank act that aims to make tissue sampling easier and more accessible.

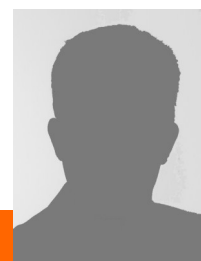
Björn Dahllöf from Novartis Pharma AG (Basel, Switzerland) and Erika Rehnström from AstraZenica R&D (Mölndal, Sweden) made a joint presentation focusing on the key areas of interest from a commercial perspective.

Mats G. Hansson discussed the ethical aspects on biobanks from a national and international perspective. The presentation concluded that ethical aspects continue to present a challenge to the future development of biobanking and that much work is being done in this area to address the matter.

Per A. Foss from HUNT Biosciences AS (Levanger, Norway) provided a detailed account of the HUNT biobank and presented some of the studies that are being done with the help of biomaterial.

Final speaker, György Marko-Varga of Clinical Protein Science & Imaging at Lund University (Lund, Sweden), discussed the challenges and opportunities for biobank development while outlining all the important key aspects surrounding the setting up of a national quality biobank. The seminar was concluded with a panel discussion.

My conclusion is that the biomedical industry is very interested in the development of the biobanking area. My belief is that further interaction with these important stakeholders is likely to significantly impact the development of the biobanking field.





*Merry Christmas  
&  
a Happy New Year  
from all of us at  
BBMRI.se*