

# NEWSLETTER

Issue No. 1/2016



# B<sup>3</sup> Africa

BRIDGING BIOBANKING AND BIOMEDICAL RESEARCH  
ACROSS EUROPE AND AFRICA

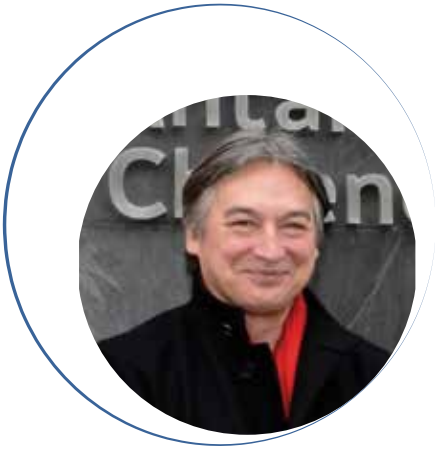
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# Editorial

by the Project Coordinator



## Project Coordinator and Work Package 8 – Coordination leader:

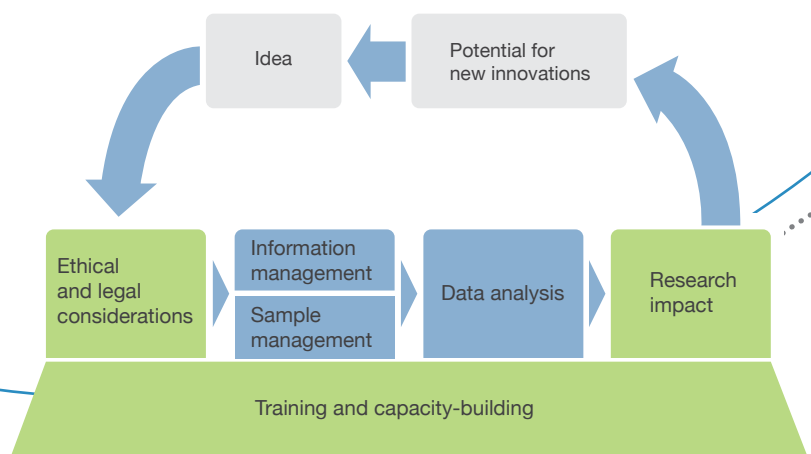
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The rapidly evolving African biobanks are invaluable for biomedical research because the African population has the greatest genomic diversity on the planet and represents an incredible resource of information to advance fundamental understanding of health and disease.

Biological specimens have been collected for decades, but only since the late 1990s have biobanks been established in a more systematic way. Biobanks collect and store a variety of (mostly human) samples from tissue, cells, blood, saliva, plasma, or DNA. These samples are essential in biomedical research to understand disease mechanisms and develop new therapies.

Eleven partners from African and European countries are jointly developing a collaboration framework and an informatics infrastructure that accelerates and facilitates biomedical research across the continents to address global health challenges together. Via the Horizon 2020 work programme, the European Commission is providing a budget of about 2 million euros over a period of 3 years for the B3Africa initiative, which involves a highly motivated group whose activities are presented in this first newsletter.

**FIGURE 1:** The B3Africa project is built upon a technology platform, in the form of the eB3Kit (blue), and social components (green). Together, the components contribute to strengthen African and European research communities in low- and middle-income countries by reducing thresholds in the research cycle.



## B3Africa has two strategic aims:

1. Create a harmonized ethical and legal framework between European and African partner institutions. A common ethical and legal framework is essential for a trustworthy informatics platform that will enable the sharing of bioresources and data and will also consolidate cooperation in biobanking between Africa and Europe.
2. Provide an “out-of-the-box” informatics solution that facilitates data management, processing, and sharing and can also be used under challenging networking conditions in Africa and Europe.

Both aims are explained in more detail in Figure 1.

# Note from Work Package 6

## Dissemination



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**FIGURE 2:** B3Africa partners from Europe and Africa joined for the kick-off meeting, at the University of the Western Cape, Cape Town, South Africa.

We are delighted to present to you the inaugural B3Africa newsletter as part of the project's dissemination activities. The goal of Work Package 6 (WP6) is to sensitize potential users and stakeholders about the availability of the eB3Kit and the biobanking and bioinformatics platform, and to encourage their use in Africa and Europe, to facilitate collaboration and increase the efficiency of scientific research across the two continents.

Due to the diversity of roles of the key players within a research organization, several educational programmes and stakeholder forums will be implemented to target specific groups, including information technology (IT) professionals, researchers, clinicians, technicians, policy-makers, and ethics committee members.

In addition to the dissemination activities, training programmes will be organized in collaboration with the education and training Work Package (WP5) and technical and scientific Work Packages (WP2–4, 7). The stakeholder forums will discuss ethical, legal, and social issues (ELSI) related to biobanking and the basic ELSI principles that will be included in the regulatory framework (WP1). These principles will capture the diverse national, regional, and cultural specificities and promote the utility of the eB3Kit.

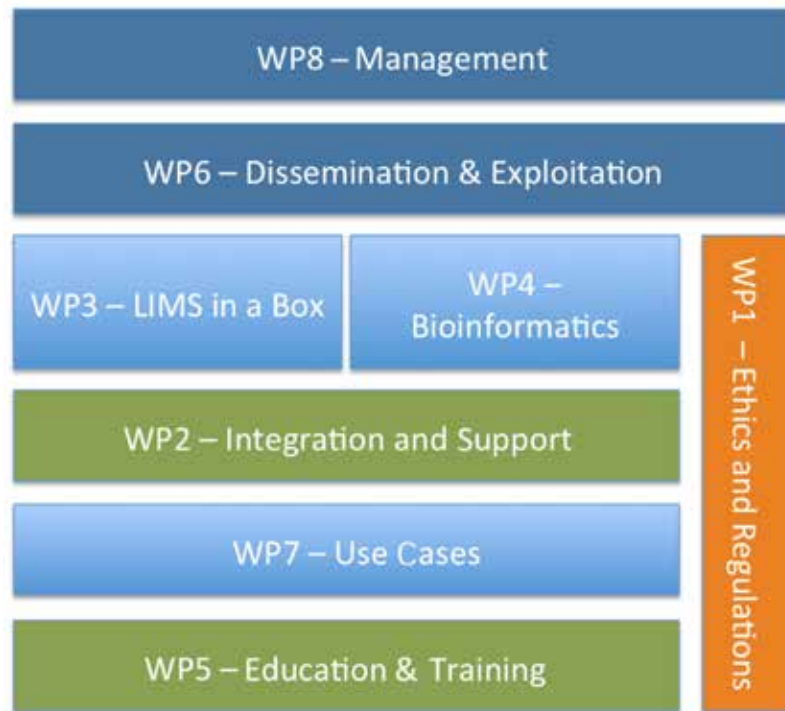
### Update on WP6 activities:

- Immediately after the kick-off meeting in Cape Town, South Africa, in August 2015, a press release was posted on partners' websites: <http://www.b3africa.org/?p=37>
- An introductory video was also produced during the kick-off meeting: [https://www.youtube.com/watch?v=Vi\\_JaoPrts8](https://www.youtube.com/watch?v=Vi_JaoPrts8)
- The project website was launched in September 2015 and will be the main medium of communication with the wider community. It will provide information on project progress and outcomes: [www.b3africa.org](http://www.b3africa.org)
- Periodic newsletters will be published to disseminate information to a wider audience, and we are pleased to present this inaugural edition. **To subscribe to the newsletter** and get timely news from the project, visit our website!
- A detailed dissemination plan is in preparation. To this end, we are currently compiling information on biobanking stakeholders at different levels (technical, ethical, political, etc.). We are also in the process of identifying relevant dissemination opportunities (conferences, papers, etc.).



# Updates from other Work Packages

FIGURE 3: The B3Africa project is structured in eight Work Packages.



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## Work Package 1

### Ethics and Legal Framework for the Storage, Analysis, and Sharing of Biobanking and Research Data

Work Package 1 (WP1) is creating a harmonized ethical and legal framework between European and African partner institutions. It has as a point of departure two basic bioethical principles: the requirement of informed consent for handling human biological samples and data, and the need for approval from a research ethics committee before conducting a research project.

WP1 works together with the other Work Packages in order to establish a common understanding of basic concepts and principles. From this, we will define minimum standards for all participants and users of the B3Africa platform, taking into account European Union (EU) and African standards. Further, WP1 will identify legal solutions for allocating the

legal responsibilities in each individual case, via data and/or material transfer agreements.

The legal and ethical framework will further be implemented in the B3Africa platform in the form of a Model Data Management Policy (MDMP). The model will provide a set of formal rules, criteria, and priorities that should guarantee a consistent ascertainment of all requirements that should be fulfilled by the platform and its users.

WP1 will work together with Work Package 6 to initiate a dialogue with relevant stakeholders, especially the African Union and the New Partnership for Africa's Development (NEPAD).



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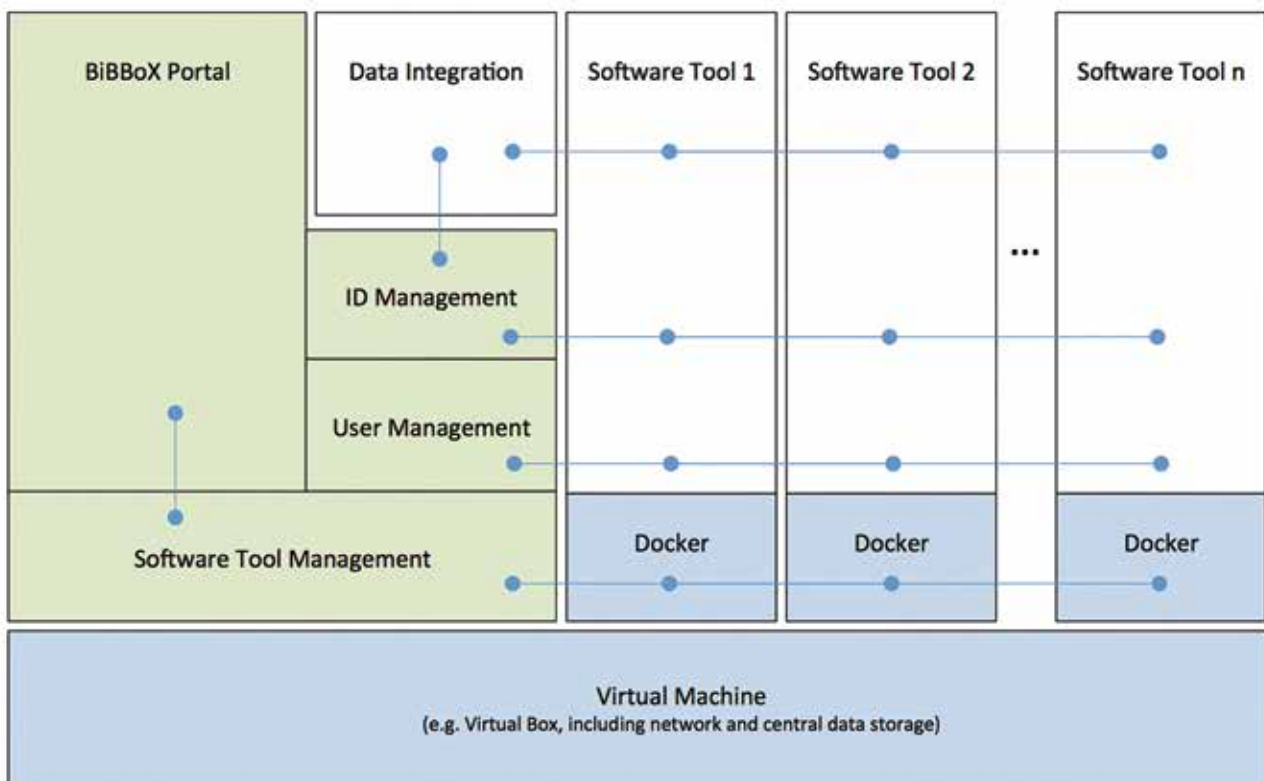
## Work Package 2 Integration and Support

Work Package 2 (WP2), the integration Work Package, will provide a curated platform for open-source software, Biobank in a Box (BiBBoX). Out of this evaluated and preconfigured toolset, the eB3Kit will be assembled according to the needs of our use cases.

Within BiBBoX, software components are configured, ready to use with minimal information technology (IT) effort. The software collection will cover core functionalities necessary to operate a biobank, including bioinformatics support through the eBioKit (see Work Package 4). In addition, application programming interfaces (APIs) will be specified to integrate open-source software solutions in the areas of electronic health records (EHRs), patient and study management, imaging, and data integration and analysis. The first version of BiBBoX is already accessible at <http://bibbox.org/virtual-machine>.

The BiBBoX system architecture is built on top of a Virtual Machine and Docker containers (Figure 4). A lightweight central component (shown in green in Figure 4) will provide functionality for the deployment of software tools as well as central identification (ID) and user management. The results of Work Package 3 (Laboratory Information Management System (LIMS) in a Box) and Work Package 4 (Bioinformatics) will be integrated and will cover functionalities for sample acquisition and sample metadata management, sample processing, sample storage, and sample and data retrieval/distribution. Furthermore, we plan to include a broad range of tools, as described at: <http://bibbox.org/software-shortlist>.

**FIGURE 4:** The BiBBoX system architecture. Besides software tools, the BiBBoX portal also collects other useful resources for biobanking activities, such as free icon sets (<http://bibbox.org/icon-sets>) and cheat sheets (<http://bibbox.org/cheat-sheets>).



# Updates from other Work Packages



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## Work Package 3

### Laboratory Information Management System (LIMS) in a Box

Work Package 3 (WP3), the Laboratory Information Management System (LIMS) in a Box package, will provide an open-source LIMS system to track biospecimens in a biobank laboratory.

The LIMS system must track the life cycle of a biospecimen through collection, shipping, analysis, storage, retrieval, and reporting. These steps, or part thereof, have been implemented in various open-source LIMS, such as BIKA-LIMS. WP3 will harness open-source modules to deliver a LIMS suitable for biobanking and critical to the pilot sites in Africa and Europe. The LIMS design will allow modules to be interchanged depending on the needs of the user community. These modules will be integrated with other tools by WP2 into a curated platform called Biobank in a Box (BiBBox).



*“The eB3Kit components will be integrated and used as part of workflows that cover biobanking and research from sample collection, sample storage and management to study design, experiment, bioinformatics analysis, results, and publications.”*

*— Erik Bongcam-Rudloff, Project Coordinator*



## Work Package 4 Bioinformatics

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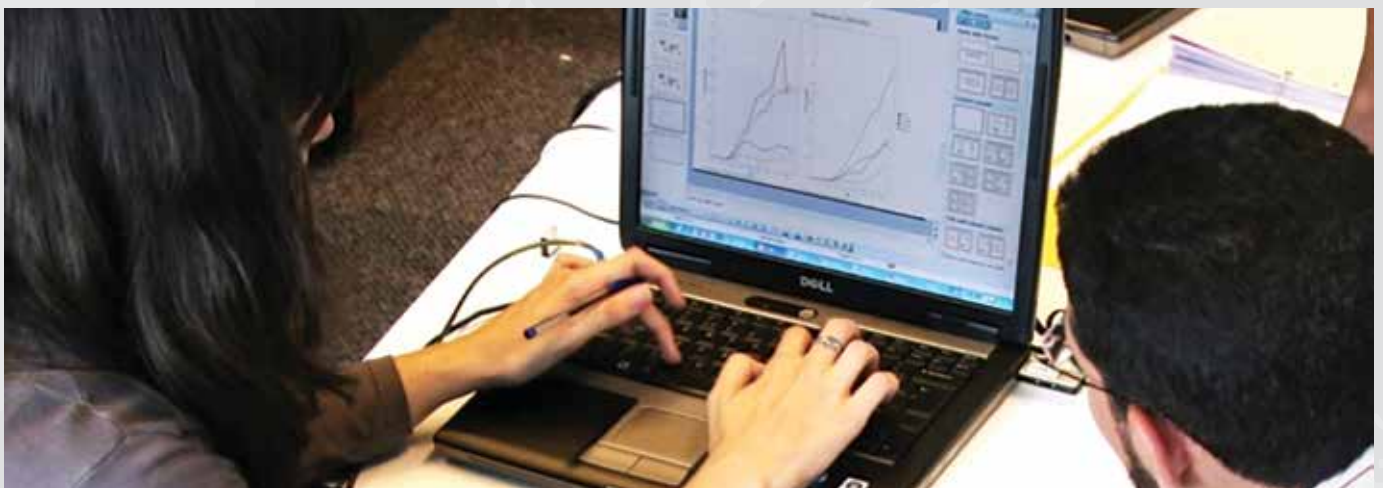
The B3Africa technical platform – the eB3Kit – will draw on the experience and lessons learned from the development of the eBioKit, a bioinformatics portal created in collaboration with (among others) the Pan-African Bioinformatics Network for the Human Heredity and Health in Africa (H3Africa) initiative, H3ABioNet.

The eBioKit is made to allow researchers to conduct bioinformatics-based research without having access to a reliable Internet connection. The bioinformatics tool set has increased in size over time and may overwhelm an inexperienced bioinformatician.

Currently, the eBioKit runs a combination of databases, bioinformatics tools in the Galaxy workflow management system, and separate command line tools. Working

in Galaxy is much easier for researchers with limited experience in programming or executing command line scripts, and we have decided to integrate all bioinformatics tools in the eB3Kit bioinformatics package into Galaxy.

The tools used in the eB3Kit will be based on the current Galaxy implementation of the eBioKit, commonly used tools in the eBioKit that can be integrated into Galaxy, and a survey among researchers on current needs. In the future, the two forks will support each other: the eB3Kit serves as a vehicle for the development of the Galaxy-based component of the eBioKit, while the eBioKit serves as a test bed for new tools that may be implemented in Galaxy.



*“The eBioKit used in the H3ABioNet project has proven to be highly successful as a standardized learning environment for bioinformaticians.”*

*— Tomas Klingström, WP4 leader*

# Updates from other Work Packages



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## Work Package 5 Education & Training

Work Package 5 (WP5) aims to develop and implement resources for education and training on the use of the eB3Kit, including best practices in biobanking, bioinformatics data analysis, and data sharing with respect to the relevant ethics and regulations. By ensuring that the eB3Kit is well integrated and used by pilot institutes (use cases), WP5 will contribute significantly to the effectiveness and sustainability of the project.

The eB3Kit will be installed and tested in real-life settings (use cases), where key professionals involved will be trained. In order to produce learning material that is perfectly tailored to eB3Kit developers and future users' needs, a learning needs assessment (LNA) has recently been launched. Following a secondary data analysis of another LNA, performed in the framework of the Low- and Middle-Income Countries (LMIC) Biobank and Cohort Building Network (BCNet), eB3Kit developers and future users will be consulted.

Besides knowledge and skills specific to eB3Kit components (tool-specific), other competencies (core competencies) will be considered for the effective and sustainable use of the eB3Kit. Available learning resources/opportunities within B3Africa and related collaborators will be identified, in order to maximize synergies between existing laboratory capacity-building initiatives.

Finally, learning materials developed throughout the implementation of the project will be produced as stand-alone generic resources organized as a standardized learning environment.

All of the above will enhance the ability to conduct training for new and/or developing biobanks, and therefore strongly contribute to creating a sustainable network of biospecimen repository infrastructures that interact and share knowledge between Europe and Africa.

**FIGURE 5:** BCNet members during their first in-person training workshop at IARC, in November 2015. Four institutes (two from Europe and two from Africa) actively involved in BCNet have been identified to participate in the B3Africa project, as use cases.





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## Work Package 7

### Use Cases

The B3Africa project will tackle one of the major challenges in biobank research worldwide: to close the research cycle in such a way that all the data generated by a research study can be consistently associated with the original samples and can hence be reused in other studies.

The B3Africa platform is an orchestration of a collaboration framework that includes the ethical and regulatory framework, a governance policy, a technical platform that consists of an informatics-integrated solution, and the eB3Kit that provides access to biobanking, biomolecular research, and bioinformatics as part of a workflow. All of these components are integrated through the joint work of several Work Packages. Work Package 7 (WP7) will test the platform in selected institutions as a proof of

concept. Synergy between WP7 and other Work Packages will guarantee systematic feedback for improvement of the platform. Several institutions have been identified as potential use cases, and they will be involved from the very beginning in different phases of project development. All the components of the B3Africa platform will be tested, including data sharing and integration with other e-infrastructures.

At the moment, we are collecting information from the potential use cases about availability of resources and processes in place, through questionnaires, surveys, and face-to-face meetings to gain insights into the requirements and to plan the use cases effectively.



*“It will be a boost to our attempts at the institute to have a structured management for our collected biospecimens.”*

— Test user from BCNet

# Upcoming Events

ISBER 2016  
Annual Meeting  
Berlin, Germany

5–8 April 2016

B3Africa Ethical &  
Legal Issues  
Workshop  
MRC, Fajara, The  
Gambia

11–13 April 2016

Biobanking as a  
Resource  
for Biomedical  
Research  
One-week course  
Stockholm, Sweden

18–22 April 2016

B3Africa  
Technical Jamboree  
Cape Town, South Africa

3–7 May 2016

H3Africa  
Consortium Meeting  
Dakar, Senegal

May 2016

IARC 50th Anniversary  
Conference.  
Global Cancer:  
Occurrence, Causes,  
and Avenues to  
Prevention  
Lyon, France

7–10 June 2016

B3Africa  
Annual Meeting  
Graz, Austria

June 2016

Europe Biobank  
Week B3Africa  
Stakeholder  
Forum No. 1  
Vienna, Austria

13–16 September 2016

B3Africa Case  
Users Training  
South Africa

November–December 2016  
(dates to be confirmed)

# B3Africa Partners

## Partners in B3Africa are:

Sveriges Lantbruksuniversitet (SLU), Sweden; Biobanking and Biomolecular Resources Research Infrastructure Consortium (BBMRI-ERIC), Austria; Karolinska Institutet (KI), Sweden; Centre for Research Ethics & Bioethics (CRB) at Uppsala University, Sweden; University of the Western Cape (UWC), South Africa; Makerere University (MAK), Uganda; Stellenbosch University (SU), South Africa; International Agency for Research on Cancer (IARC), France; International Livestock Research Institute (ILRI), Kenya; Medizinische Universität Graz (MUG), Austria; and Institute of Human Virology Nigeria (IHVN), Nigeria.



**B3**  
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