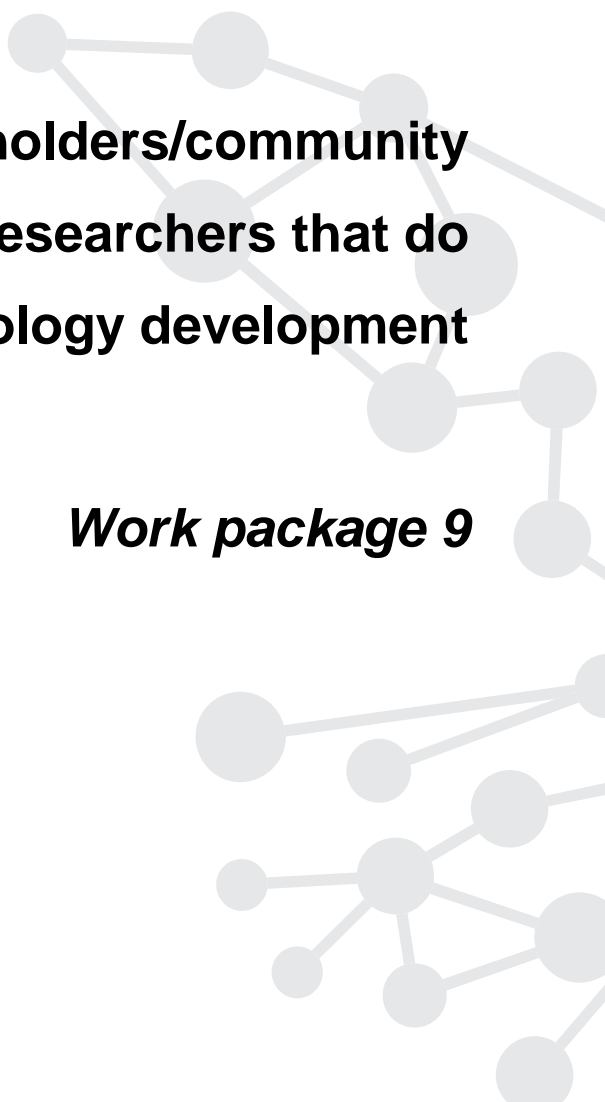


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**Survey to identify stakeholders/community
members/individual researchers that do
technology development**

Work package 9

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Dissemination level: PU = Public, RE = Restricted to a group specified by the Consortium (including Commission services), PP = Restricted to other programme participants (including Commission Services), CO= Confidential, only for members of the Consortium (including the Commission Services)

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SUMMARY

ISBE has been intensively working with the Systems Biology community from academic and industry field to obtain all relevant information to understand the systems biology needs in Europe. In the preparatory phase and its efforts to gather information in order to properly construct and manage a distributed research infrastructure of interconnected systems biology centers that provide resources and services, ISBE has collected various data via numerous sources such as

- Community website (<http://community.isbe.eu>)
- WIDE survey
- Audit of Systems Biology provision
- Use of MERIL database - *[The MERIL](#) database is an inventory of openly accessible research infrastructures (RIs) in Europe of more-than-national relevance across all scientific domains: from archives and statistical offices to biobanks, satellites and particle accelerators.*

Our main task for deliverable 9.5 was to identify the stakeholders/community members and individual researchers that do TECHNOLOGY DEVELOPMENT and are involved in technology development projects. Robert G. Cooper in his Research technology management specifies that Technology development projects are the foundation or platform for new products and new processes and thus are vital to the prosperity of the modern corporation and institutes.

The term “technology development” refers to a special class of development projects where the deliverable is new knowledge, new technology, a technical capability, or a technological platform. These projects, which include fundamental research projects, science projects, basic research, and often technology platform projects, often lead to multiple commercial projects—new product or new process development. (Cooper, <http://www.stage-gate.com>).

Institutions and researchers that we contacted are heavily involved in Technology development projects and are therefore contributing to a new products and processes that are crucial for any company, university and institute prosperity and survival in today's competitive market.

In collaboration with WP5 which has recently integrated in the ISBE Systems Biology database (Audit coordination table of 95 institutes) a collection of tables with linking fields through unique ID fields, locating the Institution and Researcher name with other relevant information, we were able to follow up with the systems community in a very effective and direct manner. We constructed a short [survey](#) to identify researchers involved in Technology development including:

- a) New Technology
- b) Technical Capability
- c) Technological Platform

The information collected and an array of Technology development projects will be complementary to the services that ISBE will provide to the European Research Area. Via this database, the community will become aware of what type of current advanced technologies (such as new technology projects, Technical Capability and technological platforms) suitable for systems biology are in use or in development in European institutes. In terms of how ISBE will serve its users in providing access to diverse skills and expertise, this knowledge will improve the connection between the users and national Systems Biology centers nSBCs that will provide the services, maintain the resources and ensure training and user outreach. In addition it will help to identify technology areas that may increase in priority for systems biology research and help identify potential gaps and weaknesses that will need to be addressed in order to improve the network of expertise and services within ISBE over time.

TOOLS, METHODS AND STEPS

For our survey we used the ISBE Systems Biology database (Audit coordination table) that has been recently created by WP5 conducting the Audit of systems biology Resources and services. The database contains a nearly complete list of systems biology centers in all countries and related contacts. WP9 has improved this list by adding the corresponding email addresses to be able to communicate with scientists directly via email. ISBE has defined for each country the relevant national coordinator whose role was to manage the communication with institutes, labs and individual scientists. Illustration of steps followed by images of survey procedure presents the method of our task.

Technology Development projects

1. step

Use of Audit coordination table

2. step

Create the online survey form

3. step

Create a survey email letter (page 9)

4. step

Contact the country coordir

5. step

Collect the information

6. step

Analyze the results of the su



In step 3. we created a letter to send to contacts identified by country coordinators, inviting them to contribute to the online survey.

One issue specific to the technological aspects of the projects that we were trying to identify is that, unlike many other aspects of systems biology of immediate interest to ISBE, these may be taking place in groups or institutions not specifically identified as systems biology centres within the Audit coordination table. For instance, work in areas relevant to instrumentation, data collection and analysis methods. So, in addition to the data collection above, we have approached directly, groups identified during interviews, discussions and through country-specific knowledge in areas identified as important for technology development by the expert advisory group, and during the original ISBE survey. The questionnaire was designed to be a light-touch, to encourage participation, Significant technological development is also expected to occur within the commercial sector, but this will be investigated by other means, outside the scope of this survey.

SURVEY OF TECHNOLOGY DEVELOPMENT PROJECTS

List of Country coordinators

Country	Coordinator
Czech Republic	Rudiger Ettrich
Finland	Garry Corthals
Germany	Angela Krueger
Greece	Dimitris Thanos
Ireland	Will Fitzmaurice
Netherlands	Frans van Nieuwpoort
Norway	Jon Olav Vik
Slovenia	Kristina Gruden
Spain	Joaquim Calbo
Sweden	Marija Cvijovic
United Kingdom	Barbara Skene
Italy	Hans Westerhoff

Survey – still accessible

The survey is ongoing and in order to remain up to date and relevant in this key area, it will remain available for new input – which will be periodically assessed. –.



Questions asked

1. Are You Involved In Technology Development Project?
(*New Technology, A Technical Capability, Or A Technological Platform*)
2. If you are or your department involved in technology and methodology development project, please indicate which of the following areas you specialize in?
Instrument Development, Instrument and Software, Analysis tools, Experimental Methodology
3. What Is The Name Of The Project? URL address
4. Description Of The Project / What is the aim and the expected outcome?
5. Research Area - Please tick all the boxes that indicate key areas that apply to your project(s)
6. Is Anyone Else At Your Institute/University Involved In a Technology Development Project?
Please provide department name and the leader.
7. Would you agree in principal to contact you in the future for more details and in depth discussions?

In order to maximize the further usability of the questionnaire output, respondents were asked to self-categorize their entries in one or more of the following areas previously identified by WP9 deliverables as being of importance:

- DNA Methylation/epigenetics
- Single cell study
- DNA sequencing
- ChIP-CHIP/ChIP-Seq /RNA-Seq
- Array – protein/peptide
- Array – carbohydrate/antibody/other
- Metabolomics
- Proteomics
- Phospho-proteomics
- Digital PCR/ QPCR
- Light microscopy
- Large-scale computing/parallelisation/pipelines cloud
- Tools for model editing/annotation/visualization
- Modelling –general
- Model exchange
- Data integration
- Data analysis
- Data standardization/sharing

Survey letter

LETTER TO SYSTEMS BIOLOGY INSTITUTES/DEPARTMENTS THAT ARE
INVOLVED IN TECHNOLOGY DEVELOPMENT PROJECTS

Dear X (our contacts in database),

As you already know from our recent contact, [ISBE](#) is planning to create an infrastructure supporting systems biology research across Europe, and is currently in its preparatory phase. Moving soon-soon-soon (our New Year's resolution :) into the construction phase, ISBE will provide services (such as systems modelling, data/model management and data-generation) open to the entire academic and industrial community of systems biologists, and to the wider life science community.

As part of our preparatory activities, we are now addressing only a few SB institutes or departments that might be INVOLVED IN TECHNOLOGY DEVELOPMENT PROJECTs (e.g. NEW TECHNOLOGY, A TECHNICAL CAPABILITY, or A TECHNOLOGICAL PLATFORM.

Your institute has been selected to respond because we believe it is involved in one or more technology development projects and has a potentially valuable contribution to make towards ISBE design/development.

Apologies if we have sent this to you and not the most appropriate contact for the project(s) –if so, please do let us know so we can contact them directly.

We would like to know a little more about the technological developments you are working on.

*To make it as easy as possible for you, please fill in your answers via a very [short survey](#) – it only takes less than **5 minutes** to complete - if not please call me and complain!*

More information about ISBE can be found on the website www.project.isbe.eu

Look forward to know more about your project.

Thank you in advance for your valuable time.

Country Coordinator / affiliation

SURVEY RESULTS

Systems biology is already impacting upon the diverse areas of medicine, pharmacology, food production and agriculture. It is predicted that the users of ISBE services will come from across these sectors, either from basic and/or applied science. To date, we have received information from 43 groups, across 5 countries (Czech Republic, Netherlands, Norway, Spain, Slovenia and the UK.). Of these, a total of 13 reported 'instrument' and/or 'instrument and software' development. In contrast, 23 groups reported 'experimental methods development' and a total of 37 reported 'analysis tools' and/or 'software development'.

13 sites reported in a single category, 15 in 2 different categories, and a total of 13 in 3 or more categories, with 2 non-responders. As might be expected, there was a significant overlap between reporting in the software and analysis tools categories, with 18 groups reporting entries in both. Of the 13 groups reporting in a single category, the majority were reporting either software development or analysis tools.

To portray an example of Technology Development Projects, the following is a highlight of projects listed in our response table:

Examples of Technology Development Projects:

Analysis tools, Software development / Development of portal for protein engineering:

2DE/image analysis based proteomic platform

Mesoscale Modelling of Biomolecules with Fluctuating Finite Element Analysis

BIOLEDGE - BIO knowLEDGe Extractor and Modeller for Protein Production

Towards a platform for the exploitation and analysis of Linked Data in Systems Biology

A collaborative platform for Big Data Analytics

SME E-COMPASS project is to develop two "software-as-a-service" web applications that provide European SMEs active in e-commerce with the technological tools for strengthening their sustainability, increase their customers' trust in secure card not present transaction (CNP)

Perception: Semantics in a Big Data Analytics Platform

Computational modeling of cyanobacterial cells in natural and controlled environments

Instrument development, Instrument and software, Analysis tools, Experimental

Methodology:

Two-photon polarization microscopy - new technology

Microfluidic system for intelligent characterisation of novel proteins

ANTIDotE, ANTIGONE - vaccine development

BIOGLOBE; Investigation of thin antimicrobial films prepared by plasma-assisted deposition

Development of biosensor for environmental and military applications

FLISE - Non invasive ion flux measurements with microorganisms in suspension

The survey is still open and we will continue to collate responses into the database.

Respondents could choose from a selection of self-reported key areas. We see that predominantly the focus here is on: *Light microscopy, DNA sequencing, CHIP-CHIP/CHIP-Seq /RNA-Seq in terms of data types, and Data integration, Data analysis, , Data standardisation/sharing , Large-scale computing/parallelisation/pipelines and cloud aspects of data management.*

CONCLUSION AND NEXT STEPS

This document summarizes the necessary steps for building an ISBE database of technology development projects in the field of experimental technology platforms as well as various computational methods and software. We have sent out letters and surveys and results have been collated from this stage. We will continue to encourage participation in the survey.

The database of researchers and labs involved in technology development projects will also allow other work packages teams to identify experts on specific technologies for communication to scientists outside the community (WP5) and will be used for establishing an innovation pipeline for SMEs and industrial participation (WP15). This survey was **not including industrial participation** as they are being addressed in Industry survey by WP15 through ISBE website.

This database will enable ISBE to formulate a technology vision for the operational phase of the infrastructure. It is also essential for future steps in establishing relationship with manufacturers as a part of the WP9 task 9.4.

NEXT STEPS

Our next step is keep updating the database until the dialog with potential manufactures is established. We have implemented the necessary database structures to store the information that we have gathered to date and will gather till the end of June 2015. By mid May we will analyze the updated data to select technology development projects and start a dialog with manufactures of high throughput data acquisition and analysis instruments that would be capable of installing prototypes at selected test sites within the infrastructure. The data will be shared only within the ISBE infrastructure and potential manufactures based on selected projects and individual needs of manufacturing company.