Euro-BioImaging
Preparatory Phase II Project

D7.3 Report on the procedure for determination of topics and frequency of CFS training on emerging technologies

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of the European Union

Abstract

With the aim of setting a training portfolio ensuring the training of the core facility staff in terms of latest development in imaging technologies, Work Package 7, in close collaboration with the Work Package 8, proposes a procedure in order to determine the topics of interest and the adequate frequency of core facility staff training on emerging technologies.

The present report constitutes the deliverable D7.3 of the Euro-BioImaging Preparatory Phase II project.

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1. Introduction and framing of deliverable 7.3 within the task 7.2

Work Package 7 (WP7) is responsible for the technical preparation for the coordination of training activities. To this end the task 7.2 aims to prepare the coordination of core facility staff (CFS) training in Euro-BioImaging (EuBI). The training of CFS members in terms of latest development in imaging technologies, facility management and soft skills is fundamental, as they will be the main trainers of and support for user and the broad scientific audience.

In this task, WP7, in close collaboration with WP8, sets-up the EuBI portfolio of CFS training courses in emerging imaging technologies and establishes the EuBI procedure for the determination of topics and frequency of such training (D7.3). This task sets-up the coordination of CFS access to training in emerging technologies. The preparation of the procedure for CFS training in newly emerging technologies has been conducted in close collaboration with EuBI PPII WP8, in particular during the Core Facility Staff Meeting organised by WP7 in Seignosse (France) on September 30th, 2016.

Also, recommendations presented by the EuBI PPI WP3 for integration of new imaging technologies pointed out the need to identify and follow up on new developments in biological and biomedical imaging technologies. In order to ensure the integration of emerging technologies into the Euro-BioImaging user access service or into the Euro-BioImaging training portfolio, the core facility staff will need to be in the first line of persons that need to be trained in an emerging technology. Facility staff act as important multipliers of know-how are thus an important link between technology developers and the scientific community that will apply the new imaging technology. They accordingly require access to a specific set of training opportunities. These need to be defined and coordinated inside Euro-BioImaging to provide a coordinated multi-level training that incorporates new technologies[1].

Therefore, it is fundamental to define a specific training strategy for emerging technologies and establish a rapid and efficient procedure in tune with the life cycle of these technologies to define the topics and frequency of core facility staff training. This procedure must ensure that the training offer meets the core facility staff needs.

2. Objective

The aim of this report is to propose a procedure to define the needs in terms of CFS training on emerging technologies in order to set up a training strategy with the determination of topics of interest and frequency in the implementation of the trainings. This deliverable is directly related to the deliverables of Euro-BioImaging PPII WP8 and Global BioImaging Project WP3.

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[1] See EuBI PPII WP8 D8.1

Once the emerging technologies are identified (see procedure proposed by WP8 (D8.2)), it will be important to point out in which direction the coordination should work in order to satisfy the needs of the CFS in training regarding the very specific case of the emerging technologies.

The determination of topics and frequency of CFS training will allow the construction of a first set of rules in order for the core facility to implement new trainings that provide the CFS with the necessary expertise.

A coordinated approach is especially important in the case of new technologies and applications, as these will inevitably be variable in their early stages.

3. Definition

It is important to first clarify the definition of the concept of emerging technology. During the Core Facility Staff meeting in Seignosse, the following criteria were pointed out:

1. The technology is not stabilized and still in flux
2. Publications exist (mainly linked to the developers of the technology, but some application papers are appearing)
3. There is activity in this field (linked to point 1: improvements based on the initial technology), and potentially large application field
4. Interest and users for the technology exist
5. The evaluation can be based also on expert advice (in this case, the right expertise may come from core facility staff, developers and early adopters)

If the criteria of novelty, need and applicability are met, a showcase and subsequent proof-of-concept study could lead to the inclusion in the Euro-BioImaging portfolio.

An important distinction relevant to developing training activities for emerging technologies is whether these can be offered in existing nodes or not. In case they can be implemented in existing nodes, the training has to be offered fast. Other new technologies or new fields will need to go through a future node call and the training can be implemented in parallel to the establishment of the node(s).

Based on whether a technology can be replicated inside the infrastructure and offered in multiple nodes or only in a single one, different strategies will need to be applied. These have been defined as cases 1 and 2 in the procedures for the WP8 deliverable 8.1.

4. Procedure for the determination of topics and frequency of CFS training on emerging technologies

The determination of topics and frequency of core facility staff training on emerging technologies and, consequently, the implementation of the training, is directly dependant on the life cycle of the emerging technologies.

Although the establishment of an emerging technology can be a fairly natural process, its efficient implementation in the Euro-BioImaging perimeter, and thus its corresponding training, will

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require an evaluation process or coordination system. This stands also when a field "stops" to emerge and can be considered established. An active field will need frequent reassessment and adaptation of its training offer by the structure coordinating Euro-BioImaging training activities. This will be needed to generate a controlled and quality-standardized offer. Over time the changes in the field, and with it the frequency of adaptations to the training for this technology, will drop and it will naturally transition into an established training pattern. This implies that the current EuBI training portfolio (or offer) needs periodic reassessment and adjustments.

This is why WP7 suggests the constitution of an Emerging Technologies Watch Board (see *Figure 1*) with experts from EuBI Scientific Advisory Board, user representatives, core facility staff and node representatives (or National Representatives of core facility staff) and Euro-BioImaging Industry Board (EBIB) members.

This board will have a "Tech Watch" approach aiming at the elaboration of a training strategy specific to emerging technologies. Organized by the EuBI Hub, the Tech Watch Board should have annual meetings in order to decide in which directions to prospect and determine topics of interest. The reassessment of the topics each year will ensure that the training offer is in tune with the technological innovation in biological and medical imaging.

The identification of key topics will allow the preparation of the training offer on emerging technologies and the organization of web seminars. Also, the Tech Watch Board could engage field experts for training implementation with the aim of designing training course guidelines to be used by the core facility willing to apply to offer training on emerging technologies through the Euro-BioImaging infrastructure. Recommendations about the frequency of the training activities to be offered will be part of this training course framework, and specific to each type of training activity.

Guidelines for CFS training on emerging technologies implementation:

a. Seminars +Formal Courses+ Small workshop sessions
*Frequency :*1 or 2 per year for one type of technology.
Duration: 3-5 days.
Organization: Could be done in different places with the help of companies.
Number of participants: Around 30 participants (e.g. FBI-Advanced Training[2].).

b. Expert workshops
Frequency: as much as necessary, depending on demand.
Duration: 3-days advanced introduction + hands on sessions: 3-5 days.

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[2] The aim of FBI-Advanced Training is to show how key biological questions can be addressed with advanced cellular imaging techniques. Thus it is not only a training course on state-of-the-art imaging techniques, but additionally aims at training people on how building an experimental strategy that uses these techniques, alone or in combination, to address a specific biological problem. Different topics are addressed with formal courses and multiple hands-on workshops. This training is aimed at both CFS and advanced users (PI and postdoctoral researcher, PhD focused on imaging).

Organization: On expert sites (meaning places where the technology is already used and proposed as a service).
Number of participants: max. 10 participants (e.g. Teck'o concept[3]).

Besides the elaboration of a training strategy specific to emerging technologies, the Tech Watch Board should also have a role of assessor for:
- the selection of the training activities proposals considering criteria of feasibility, accuracy and consistency with the topics defined in the dedicated calls;
- the quality evaluation of the training activities proposals and expertise of the instructors;
- the reassessment of the training activities already offered through the emerging technologies training portfolio
- Define clear guidelines for the selection of participants

Moreover, the selection procedure and criteria for participants' applications should be defined by the Tech Watch Board but the coordination and administration of the applications should be done by the EuBI Hub.
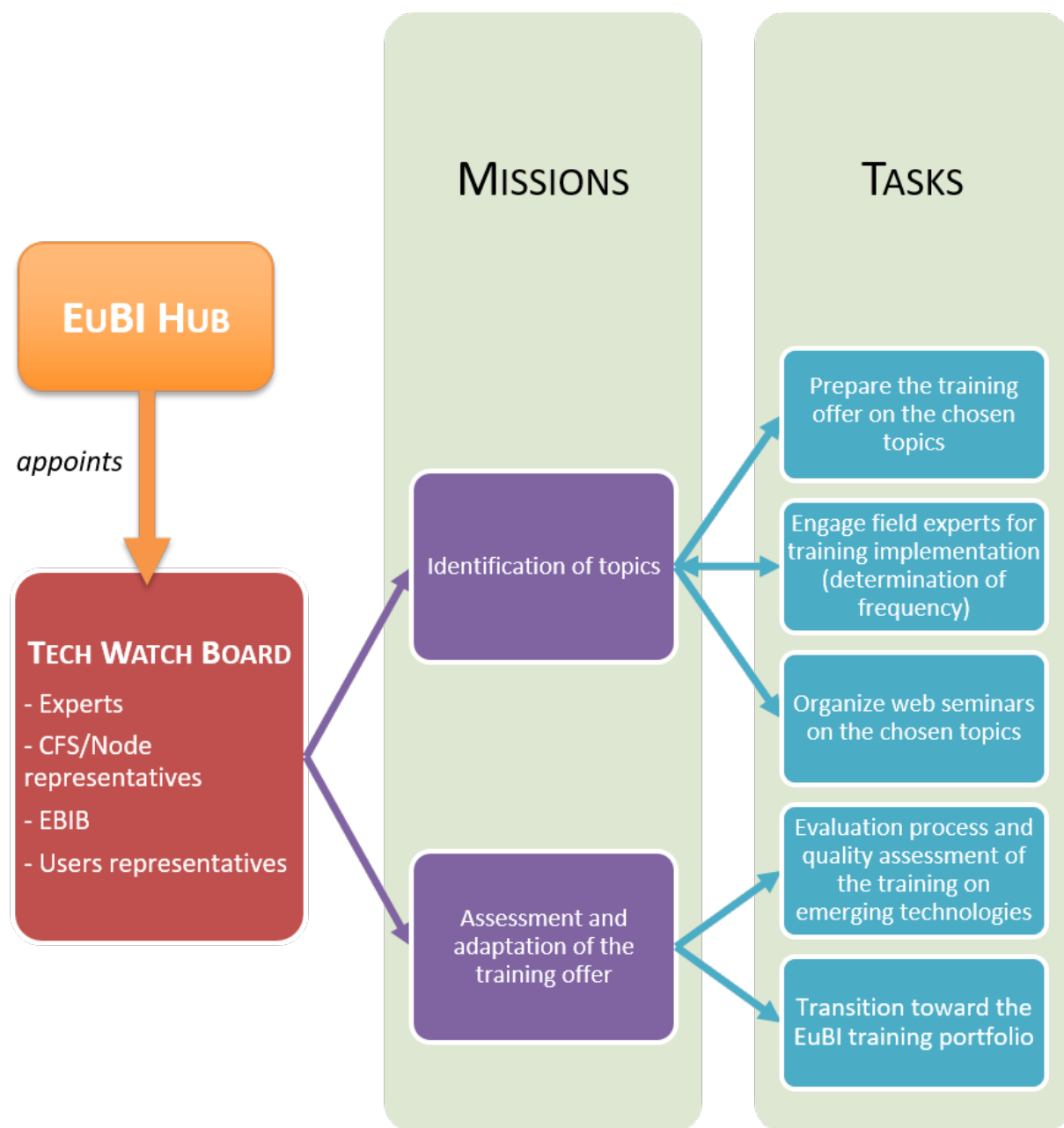
5. Conclusion

As the procedure presented in this report has not been developed in every details or tested yet, it will be a priority to be discussed with the different stakeholders -CFS representatives, EuBI Industry Board (EBIB) members, EuBI experts and user representatives - to identify possible bottlenecks and to propose an inclusive model.

The procedure for the determination of topics and frequency of CFS training on emerging technologies should allow the Euro-BioImaging training portfolio to keep pace with developments in imaging technologies and to adapt to them accordingly to ensure that it reflects the latest state-of-the-art and provide the necessary expertise to the core facility community.

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[3] Organized by the national technology networks (RTMfM and RCCM) and supported by France-BioImaging. These activities are aimed at CFS planning to offer the technology at their sites. They provide a standardized level of expertise for the service offer of the infrastructure. This type of training is aimed at a small group of participants (max. 10) and consists of one day of advanced introduction followed by more days of hands-on training. The training is conducted only at expert sites (when they exist) selected for this activity with the strong help of the industrial partners.

Figure 1: EuBI Tech Watch Board missions and tasks

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Annex 1: Minutes of EuBI PPII WP7 CFS meeting, September 30th, 2016, Seignosse

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Draft Minutes

Euro-BioImaging WP7 CFS Meeting

Seignosse, France

September 30th, 2016

Programme

9 :00 – 9 :15	Welcome - Introductory session – *Daniel Choquet* Objectives of the upcoming activities
9 :15 – 10:00	Existing training activities – *Caroline Thiriet* • Presentation of the results of the EuBI WP7 surveys: *First list and description of identified sites for EuBI user and CFS trainings (D7.4) based on the survey* *First list of identified CFS training courses (D7.5) based on the survey*
10 :00 – 10 :30	Implementation and coordination of the EuBI training activities (D7.2) – *Claire Herzog* • Proposal for: - Pre-requisites for inclusion in first listing of EuBI TS and TC - course evaluation procedures and certification (EuBI), - training sites certification, - user and CFS access application procedures,
10 :30 - 11 :00	Discussion – Coffee Break
11 :00 - 11 :30	Identification of trainings on emerging technologies (D7.3) – *Timo Zimmermann* • "Procedure for the implementation of training of CFS on identified new emerging imaging technologies" WP8 (D8.1)

11 :30 – 12 :00	Identification of trainings on emerging technologies (D7.3) - *Christoph Thumser* • "View from the Industry Board"
12 :00 – 12 :30	Discussion
12 :30— 13 :30	Lunch break

13 :30 — 14 :00	Implementation of an e-training program (D7.6) – *Fabrice Cordelières*
	
	   • Definition of topics and identification of milestones
	
	   • Discussion and proposal for a roadmap

14 :00 – 14 :15	Discussion
14 :15 - 15 :15	Parallel sessions: 1 – Construction of a competency profile (*Fabrice Cordelières*) 2 – Criteria for training certification (*Silvio Aime*) 3 – Emerging technologies (*Timo Zimmermann*)
15 :15 — 15 :45	Summary of the parallel sessions
15 :45 — 16 :00	Closing session

Participants

Silvio Aime, CNR, Italy, EuBI PPII WP4

Jordi Andilla, ICFO -The Institute of Photonic Sciences, The Barcelona Institute of Science and Technology, Spain

Ales Benda, Advanced Light and Electron Microscopy Multi Modal Multi Sited Node, Prague, Czech Republic, Czech Republic

Daniel Choquet, France BioImaging, France, EuBI PPII WP7

Genevieve Conejero, France BioImaging, France

Fabrice Cordelières, France BioImaging, France, EuBI PPII WP7

Vicky Diakou, France BioImaging, France

Orestis Faklaris, France BioImaging, France

Claire Herzog, France BioImaging, France, EuBI PPII WP7

Eija Jokitalo, Finnish EuBI node, Finland

Frauke Leitner, EuBI Bio-Hub Candidate, Germany

Sébastien Mailfert, France BioImaging, France

Sébastien Marais, France BioImaging, France

Alzbeta Marcek Chorvatova, Slovak BioImaging Network (SkBIN), Slovakia

Cédric Matthews, France BioImaging, France

Perrine Paul-Gilloteaux, France BioImaging, France, EuBI PPII WP7, WP6

Inga Pukonen, Finnish EuBI node, Finland

Jean Salamero, France BioImaging, France, EuBI PPII WP7

Paula Sampaio, PPII WP7 member / Future PPBI node candidate, Portugal

Beatrice Satiat-Jeunemaitre, France BioImaging, France

Stefan Terjung, Advanced Light Microscopy Facility, EMBL, Germany

Corinne Tessier, France BioImaging, France

Caroline Thiriet, France BioImaging, France, EuBI PPII WP7

Christoph Thumser, Euro-BioImaging Industry Board, Germany

Marc van Zandvoort, Maastricht University, the Netherlands

Timo Zimmermann, SLN@BCN, Spain, EuBI PPII WP8

Welcome – Introductory session

After a welcome note by Jean Salamero, Daniel Choquet takes the word and welcomes the meeting's participants, introducing the meeting as the Euro-BioImaging Preparatory Phase II (EuBI PPII) CFS meeting.

Daniel Choquet presents the objectives, activities and deliverables of WP7, and highlights the different upcoming activities of the CFS meeting.

1. **Existing training activities – Caroline Thiriet**

See Annex 1

Caroline Thiriet presents the outcome of the Training Site and Training Course Surveys conducted by the EuBi PPII WP7 from May 29th to July 15th, 2016 and reminds the objectives of both surveys:

- Identification of the training sites for user and CFS training
- Identification of the training courses to be offered through the EuBI portfolio
- Creation of a EuBI training portfolio

Both surveys have been implemented using the Survey Monkey tool.

The analysis of the data gathered through both surveys allowed to identify 30 training sites, representing 17 Nodes Candidates (including the Brain Imaging Network of Portugal) in 11 countries. Also, 59 training courses have been registered, representing 11 Nodes Candidates (including the Brain Imaging Network of Portugal) in 8 countries.

The information extracted from the results of the surveys draw a profile of the EuBI training courses to be offered. Most of the trainings registered are dedicated to biological imaging (90%), teaching hard skills (83%), are aimed at users (43%) and are basic level courses (49%).

The results of the surveys also show that the training sites are contemplating to implement new training courses over the next year.

Then, several problematic issues are presented:

- The difficulty to identify medical imaging training courses
- The difficulty to identify e-training courses
- The lack of virtual platforms devoted to online/e-training
- The fact that not all the training registered are taught in English
- The need of training activities on advanced level when the offer is more important on basic level.

Finally, the different list of identified training sites and training courses are presented.

Discussion:

The idea of a new survey to identify the needs in training in order to complete the information gathered through the Strategic Inventory Map in 2011 (PPI WP13) is brought up. Daniel Choquet mentions that the identification of needs was not defined as a task of the PPII WP7 at this stage of the portfolio

construction. In the future, the assessment of the needs should be part of the tasks of the EuBI training office to insure that the training offer meets the needs of the users.

The need for the core facility staff to be trained on a higher level and the importance of the teaching of soft and generic skills are pointed out.

In order to insure the representativeness of list of training courses identified through the surveys and the real training offer, it is suggested to send the surveys not only to the Heads of Nodes Candidates and core facility staff but also to the research teams and Industrial Board members. Timo Zimmermann adds that it could be an efficient way to identify the emerging technologies.

Silvio Aime stresses the importance to address the problem of the medical imaging training representativeness in the EuBI training portfolio. It is important to see whether it shows a lack of existing training activities in medical imaging or a lack of reactivity from the Nodes Candidates.

Silvio Aime adds that there is a huge amount of training in medical imaging, and that they are currently working on a e-repository. This e-repository could be linked to the EuBI training e-repository.

Also, it is suggested that a shadowing program could be a way to compensate the lack of medical training courses registered.

2. Procedures and criteria – Claire Herzog

See Annex 2

Claire Herzog presents a first list of criteria for the evaluation and certification of the training sites and courses to be included in the EuBI portfolio. Claire indicates that this first list is based on the work previously done by the PPI WP3. The different criteria will be discussed during the upcoming parallel session.

A two-level evaluation system is presented:

- Registration in the EuBI training portfolio
- EuBI stamp of excellence

For each level of evaluation, a list of criteria is presented.

Claire also presents a proposal for the different procedures to be implemented in order to coordinate the EuBI training activities:

- evaluation and certification procedures
- procedures for user/CFS application

Discussion:

The first point brought up is the definition of open access and restricted access criteria. Some training courses are restricted to a specific community, e.g. CNRS in the case of France.

A general comment shared by all participants is that the criteria of "Being an EuBI Node" should not be necessary for the EUBI stamp. And the question about including sites that are not nodes in the EuBI portfolio is brought up.

Then, the idea of the creation of "training nodes" is discussed, with the question of the preparation of a special call for training nodes to apply. Silvio Aime adds that some specialized nodes could be developed in order to increase visibility.

Silvio mentions that the visibility of the sites could be incremented through the certification process.

Timo Zimmermann stresses out that this certification process should include the emerging technologies.

> ➢ Several criteria will be discussed during the parallel session and the input will be included in the final report.

There is a difference between the quality of the training and the quality of the site, thus the certification system should take into account both. It is the task of the Hub to define a quality control on the course activities. It is pointed out that the ISO label is not necessary and should not be considered as an EuBI criteria.

Regarding the procedures for the EuBI certification, the criteria of the reporting to the Hub after the training activity took place is pointed out as a key topic. It should be a requisite to give a feedback after the training activity is done. However, a third category without feedback should be added in order to be more inclusive and not leave down what is available.

Christoph Thumser mentions that in the case of the Industry Board quality seal, the measure of the quality of the training activity is done through the measure of key performance indicators over time.

3. Identification of trainings on emerging technologies - Timo Zimmermann - WP8

See Annex 3

Timo Zimmermann summarizes the objectives of the PPII WP8 "Preparation of identification of new technologies", which are to:

- Develop the procedure for identification and evaluation of new imaging technologies for which a need for user access via EuBI exists,
- Develop the procedure for identifying out-dated technologies in EuBI for de-commissioning.

He then presents the procedures for the implementation of core facility staff training on identified emerging imaging technologies proposed in the preliminary version of the deliverable D8.1.

Distinct training formats offer different levels of exposure that allow a progressive familiarization with the new technology. The following formats can be applied to core facility staff training:

- Seminars: These can provide an initial familiarization with a new method, but lack the possibility of applied training and experience.

- Workshops and training courses: These provide a deeper understanding and practical expertise of the method in a standardized and coordinated manner

- Advanced technology training: More individualized activities aimed at a small group of participants to make them experienced users.

- Training stays at expert sites: These provide the most applied form of training under realistic working conditions.

The categories of new imaging technologies that affect the training strategy are: a new imaging method based on existing instrumentation, a new imaging method based on new instrumentation, an imaging technology can be offered in one or a few existing Euro-BioImaging nodes, an imaging technology is offered in a newly created node, a method can only be offered at dedicated sites, a technology is offered by commercial providers, a technology is only available on custom-built instrumentation.

➢ These categories will be discussed during the parallel session and the input will be included in the final report prepared by WP8.

Two training procedures for new imaging technologies are presented:

- The new technology can be distributed over many sites inside Euro-BioImaging,

- The new technology is incorporated only at specific sites. For very dedicated instrument-based methods, access will be limited by the instrument and expertise availability not by the knowledge about the method.

For each training procedure, different levels of expertise are established: initial, practical and advanced.

Timo mentions that an input from the medical imaging point of view will be needed to complete this framework. Specialized nodes could be identified.

The need to provide a defined standard of expertise and harmonized training modules will be challenging in the case of the emerging technologies that keep developing and need frequent assessment of the state of the art and a subsequent adaptation of the training activities. This could initially be done or aided by regular (annual) meetings of a technology committee (watch board) consisting of experts from academia and technology companies and core facility representatives, aimed at scouting for emerging technologies.

Timo adds that the final procedure will be affected by the input collected during the Leica Super-Resolution User Club, the EuBI WP7 CFS meeting, and the EuBI conference calls.

Finally, Timo presents the feedback about the identification of new emerging technologies and training from France-BioImaging provided by Jean Salamero.

Discussion:

The first point brought up is the need to define the place of the emerging technologies in the EuBI portfolio and the criteria for their certification. All offered activities are a part of the coordinated Euro-BioImaging training activities that are currently being developed in WP7 and therefore are aimed at providing a defined standard of expertise inside the infrastructure and meet specific criteria.

➢ How to set up rules in order to normalize the emerging technology in order to establish trainings?

Different issues are mentioned:

- The difference existing between trainings on the same technology among different sites.

- The difficult to find a set of rules when applied to certain type of technologies. The case of the CLEM is pointed out as an example of a methodology with a lot of technology development.

Stefan Terjung proposes to implement a proof of concept study for emerging technologies in order to set up a standardization.

Fabrice Cordelières points out that it will be important to define a set of criteria and a procedure to determine when an emerging technology should not be considered as an emerging technology anymore.

4. Evaluation of the training activities: View from the EuBI Industry Board - Christoph Thumser (IB)

See Annex 4

Christoph Thumser presents the list of EuBI Industry Board (EBIB) members and the companies looking into joining the Board and reminds the goals of the EuBI Industry Board, one of them being to participate and contribute to EuBI training activities, finding synergies with the WP7. The EBIB will coordinate training activities provided by the EBIB members:

- Register the training opportunities across Europe organized by EBIB companies

- Establish the EBIB "quality seal" certificate for training courses

The EBIB will work together with the EuBI Interim Board, the PPII partners and GBI partners in order to align the quality requirements and levels of the training activities offered through the EuBI project.

Christoph presents the procedure for the evaluation of the training courses. The courses evaluated for the EBIB quality seal should be nominated by providers using a nomination form. The evaluation committee will bring together independent experts and experts from the Euro-BioImaging project.

The EBIB has established a list of training models and training modalities and will prepare an inventory of existing training activities. This information will be available on the EBIB web page.

Discussion:

A general comment shared by all participants is the alignment of the EBIB quality seal requirements with the EuBI quality stamp criteria. It will be necessary to see how the EBIB quality standards are fitting with the EuBI criteria and vice versa. Silvio Aime adds that a work has to be done on EUBI quality stamp criteria and additional contribution will be primordial in order to be more accurate. A collaboration with the EBIB should be considered.

Perrine Paul-Gilloteaux points out that it would be interesting to know the companies' needs from the academics and core facility staff. Based on this information, the Nodes could propose and organize the training of the companies' staff.

Daniel Choquet reminds that the EuBI training courses offer should comply with the open access of training materials and cost models requirements. However, being part of a marketing process, the EBIB training material is very company oriented, which could be a disadvantage. Christoph Thumser replies that there is indeed a commercial interest but there is also an interest in instruments to be used in the

right way. Concerning the cost of the EBIB training courses, Christoph adds that this point will need to be discussed in the future and that the creation of a cost model for EuBI nodes is contemplated.

The risk of redundancy between the EuBI training offer and EBIB training offer and the necessity to see if there are overlapping contents are brought out. There is also a need to define the audiences of the EBIB training courses.

Christoph Thumser comments that the EBIB will offer financial support for EBIB activities.

Concerning the scientific action, Fabrice Cordelières adds that the first task should be to agree on a set of criteria and identify the common training courses between academics and industry. The synergy between both is already happening in workshop like MiFoBio and the core facilities are willing to work in collaboration with the companies.

5. Implementation of an e-training program (D7.6) – Fabrice Cordelières

See Annex 5

Fabrice Cordelières reminds briefly the different tasks of the deliverable D7.6 "Implementation of an online for initial and vocational training":

- establish a database of existing academic programs in bio-imaging technologies and service provision in Europe, aimed at end-users;

- implement a repository for e-material for basic imaging technology training, aimed at end-users;

- identify the resources for CFS initial and vocational training, aimed at core facility staff.

Fabrice then presents the components involved in the planning of the e-training platform. The planning must be collaborative, beginning with involving stakeholders in the entire process. Content should be relevant to needs and adapted appropriately. Technology must be accessible to users. Monitoring is essential for measuring results and must be planned for each stage of the process. Periodic evaluations are necessary to implement changes and to guaranty the quality of the training.

Roadmaps for the preparation of the content and the technological implementation are presented.

A two-level pedagogical system is presented. The system is built on two training blocks: the first one dedicated to initial training in BioImaging and the second dedicated to CFS initial and vocational training, both blocks being interconnected. As for the interactive tutorials, the platform could be linked to existing tools like Myscope or Microscopy Primers.

Finally, Fabrice presents a first inventory of existing academic programs in bio-imaging technologies in France and share the University of Bordeaux experience with the Moodle CMS.

> *Tasks for all the Candidate Nodes and EBIB:*
- Complete the list of existing e-trainings and existing resources
- Share information about existing CMS dedicated to e-training

Comments:

- The fact that all the courses online are in English could be an issue when the courses are aimed to students.
- Could the e-training be mandatory before the access to the technology?
- Necessity to coordinate with the GBI team in order to discuss about the implementation of the platform.
- The platform should take into account the difference of background between the different types of users.
- Paula Sampaio explains they are using the Moodle CMS, which is a basic tool but easy to use.
- It is important to build a useful platform for the core facility staff.
- The contents of individual chapters should be short. It will be important to shape the contents according to the needs of the users. A survey could be conducted in order to establish those needs.

6. Parallel sessions

A. Definition of the EuBI criteria - Silvio Aime

See Annex 6

B. Identification of training for emerging technologies – Timo Zimmermann

General comment: Many of the points made in the roundtable have relevance beyond the issue of developing training for new technologies.

The first point brought up by Jean Salamero was that the concept of a new/emerging technology is not defined, neither for identifying it nor in the concept of training.

The following criteria or points were mentioned:

1. The method is not stabilized and still in flux
2. Publications exist (mainly linked to the developers of the technology, but some application papers are appearing)
3. There is activity in this field (linked to point 1: improvements based on the initial technology)
4. Interest and users for the method exist
5. The evaluation can be based also on expert advice (in this case, the right expertise may come from core facility staff, developers and early adopters)

If criteria of novelty, need and applicability are met (similar to schemes developed in the first preparatory phase), a showcase and subsequent proof-of-concept study could lead to the inclusion in the Euro-BioImaging portfolio.

Here an important distinction relevant to developing training activities is that it will be more important to think about technologies/methods that can be offered in existing nodes. Other new technologies or new fields will need to go through a future node call and the training can be implemented in parallel to the establishment of the node(s).

Based on whether a method can be replicated inside the infrastructure and offered in multiple nodes or only in a single one, different strategies will need to be applied (defined as cases 1 + 2 in the procedures for the WP8 deliverable 8.1).

A general comment shared by all participants was that "technology" is a too limited term and should be replaced with a more inclusive concept, possibly "method" or "field".

This was exemplified by distinct examples also on the sample handling side in 3D-EM and CLEM applications. Clearly there are different levels of what an emerging technology or field can be.

The discussion then turned again on how to properly spot new fields. Turning back on some of the initially made comments, it was considered that the arrival and establishment of a new field can be considered as a fairly natural process and may not need a specific and complicated selection procedure inside the Euro-BioImaging infrastructure. The question was also raised when a field "stops" to emerge and can be considered established. Again, the transition may be very natural.

An active field will need frequent reassessment and adaptation of its training offer by the structure coordinating Euro-BioImaging training activities. This will be needed to generate a controlled and quality-standardized offer. Over time the changes in the field and with it the frequency of adaptations will drop and it will naturally transition into an established training pattern, meaning the current EuBI training portfolio (or offer), which of course also needs periodic reassessment.

The discussion closed around a very important issue: Especially in new fields there is a need for specialist training for facility staff. This needs to be distinct from user training as it is aimed at the operators and providers of a technology. This offer needs to be developed much more in the future.

C. Construction of a competency profile – Fabrice Cordelières

The aim of this roundtable was to define the different core facility user profiles. From there, minimum expected knowledge has to be formalised.

Users' profiles:

The first discussion was aimed at defining the different profiles of users accessing facilities.

Categorizing new users might be performed in several ways:

- Background: some are physicist, most are biologists. Under both categories, adaptation should be performed to agree on a common language. The proper vocabulary should be used to make sure both the CFS understands the users' problematic, and that the user understands the technical solution proposed by the CFS.
- Microscopy expertise: 3 categories are defined. New to microscopy, operators (users who know "where to click"), advanced users (have already been using microscopes autonomously).

Tailored training:

All participants agree that the aim of CFS is to get the user performing microscopy experiments in autonomy. However, depending on the technology users are accessing to, the training path might be

highly variable. It should always be tuned to both the user's expectations and to the complexity of the accessed technology.

Competency profile:

Although all participants agreed that users should have generic knowledge about microscopy, no real consensus emerged from the discussion about competency profiles. Each user is unique, both by her/his background and expectations. E-training resources have emerged as a way to fill the gap in our user's knowledge. It would require having highly segmented modules, from where CFS could pick from. CFS would prescribe users a highly personalised training, before accessing the facility.

Closing session

Daniel Choquet thanks all participants for their active participation in the EuBI WP7 CFS Meeting. He thanks the FBI coordination and the WP7 team for the preparation and the organization of this meeting.

The organization of a second CFS meeting next year is proposed and approved by the participants. The next meeting could be organized by another Node Candidate.