EVOLVE D5.1

Summary on "Gap analysis identifying targets for widening participation"

1. Introduction

The aim of this summary is to report the criteria that have been adopted for the identification of new and underserved user communities, as part of the EVOLVE project process of widening the Euro-BioImaging user base. This information should be considered as a complement to the Open call for Nodes: "Nodes participation in conferences targeting new user groups" and to allow applicants to better understand the context and the meaning of this call. The information provided is extracted from the deliverable D5.1 of the European Union co-funded project EVOLVE.

One of the key aims of the EVOLVE project is to increase the awareness around Euro-BioImaging services within diverse research communities and encourage their uptake of these opportunities. A lot of outreach activities are regularly undertaken by Euro-BioImaging and its Nodes to attract users, but a lot of the early activities have focussed on core user groups who have an obvious and close connection to imaging and regularly use imaging facility services.

One of the main activities to increase Euro-BioImaging awareness among new communities is to attend conferences organised by those communities and represent Euro-BioImaging.

The methodology used to conduct the gap analysis for the identification of new communities (under-represented and non-traditional) as well as the obtained results are reported in the following sections.

2. Methodology

While it is quite easy to define the community the user came from, it is more difficult and complex to define the communities Euro-BioImaging is missing. In fact, to the best of our knowledge, an exhaustive list of all the existing scientific communities is not available.

To address this challenge, all project proposals submitted by users in the timeframe 2019-2023 for biological and biomedical imaging services were categorized into scientific disciplines according to the definitions given by the ERC panel structure which provides a widely used list of research fields. In particular, ERC panels cover many fields of research in three domains:

- Physical Sciences and Engineering (PE)
- Life Sciences (LS)
- Social Sciences and Humanities (SH)

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Each user access was described with a maximum of three ERC sectors. A limited number of additional categories were introduced for areas not covered sufficiently by the ERC classification.

After the cataloguing of all users projects according to the ERC panels, an extensive analysis of the scientific sectors that are missing combined with the expertise of our Nodes and what our Nodes could support was done in order to identify the unserved groups.

During the gap analysis and the identification of unserved group, the following definitions were used:

- Traditional user communities: scientific communities that routinely use biological and biomedical imaging in their research and show high access numbers to Euro-BioImaging services
- Under-represented user communities: scientific communities that routinely use biological and biomedical imaging in their research but show low access number to Euro-BioImaging services
- Non-traditional user communities: scientific communities that do not use imaging as mainstay technique in their research but imaging might add a value to their research

Moreover, a survey was sent to Euro-BioImaging Nodes asking to suggest new communities they potentially could support.

3. Results and discussion

As expected, the most represented ERC sector is the Life Sciences one especially for those projects requiring access to biological technologies (94,6%) while for the biomedical ones the Physical Sciences and Engineering sector (PE) is also quite well represented (20%). Only few access fall in the Social Sciences and Humanities sector (SH) for both the biological and biomedical projects received.

In the Life Science (LS) sector, all categories are globally quite well represented. However, while the biological projects cover quite well the whole ERC Life Sciences scientific disciplines, the biomedical ones completely miss the Molecular Biology, Biochemistry, Structural Biology and Molecular Biophysics (LS1), Genetics, 'Omics', Bioinformatics and Systems Biology (LS2) and Ecology, Evolution and Environmental Biology (LS8) scientific sectors (Figure 1). This dishomogeneity across the biological and biomedical received applications is normal due to the areas of applications, samples and resolutions of the technologies involved. In other words, this means that disciplines that are under-represented among the biomedical projects might be quite well represented among the biological projects and vice versa.

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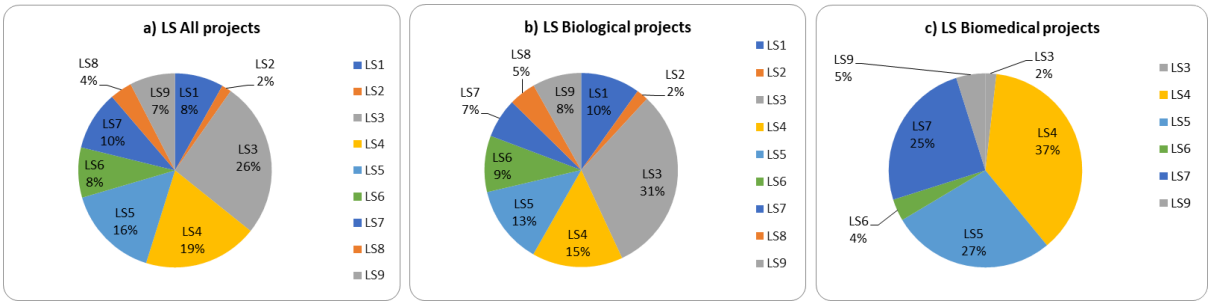

Figure 1. *Graphic representation of the main ERC sectors in which projects were categorised:* ***a)*** *all projects ;* ***b)*** *biological imaging projects;* ***c)*** *biomedical imaging projects.*
LS1: *Molecular Biology, Biochemistry, Structural Biology and Molecular Biophysics;* ***LS2:*** *Genetics, 'Omics', Bioinformatics and Systems Biology;* ***LS3:*** *Cellular and Developmental Biology;* ***LS4:*** *Physiology, Pathophysiology and Endocrinology;* ***LS5:*** *Neuroscience and Neural Disorders;* ***LS6:*** *Immunity and Infection;* ***LS7:*** *Applied Medical Technologies, Diagnostics, Therapies and Public Health;* ***LS8:*** *Ecology, Evolution and Environmental Biology;* ***LS9:*** *Applied Life Sciences, Biotechnology, and Molecular and Biosystems Engineering*

A deeper analysis of the user communities based on the ERC classification was done separating the Bio and Med groups due to the different field of applications and specificity of the biological and biomedical imaging technologies and respective user communities. For these reasons, the resulting communities to target might be in some cases under-represented at the biomedical imaging level while they are already well included among biological imaging users.

Biological Imaging projects

The biological imaging technology users' applications are managed by the Euro-BioImaging Bio-Hub and are equally distributed across a wide range of different domains.

The most represented communities that use Euro-BioImaging services are:

- Cellular biology
- Physiology
- Neuroscience
- Plant science

Communities that classically use a lot of imaging, but are under-represented among our users include:

- Developmental biology
- Molecular biology
- Marine biology
- Immunology
- Microbiology and archaeology
- Omics, particularly transcriptomics
- Parasitology

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- Biophysics, biomechanics
- Metabolism
- Ageing and regeneration
- Lipids, membrane biology
- Probe design and optimization (for microscopy)

Non-traditional communities:

- Food science
- Material sciences (not related to biological materials)
- Ecology, environmental sciences, planetary biology
- Synthetic biology
- Systems biology
- DNA structures/genome organisation
- Responses and adaptation to climate change
- Fungal biology
- Archaeology and heritage science

Biomedical Imaging projects

The biomedical imaging technologies users' applications are managed by the Euro-BioImaging Med-Hub and mostly distributed across the following four main scientific sectors.

The most represented communities that use euro-BioImaging services are:

- Cancer biology, metabolism
- Drug delivery
- New imaging diagnostic tools
- Neuroscience and functional imaging
- Synthetic chemistry

Under represented user communities, although traditional, are those focussed on:

- Immunology and infectious diseases
- Cardiovascular diseases
- Organ physiology and pathophysiology
- Veterinary sciences
- Dentistry and bone research

Non-traditional user communities, for which biomedical imaging techniques could potentially represent a useful tool, are those focussed on:

- Plant science, including plant biotechnology and plant physiology
- Food science
- Environmental biology, ecotoxicology
- Genetics, 'Omics', bioinformatics and systems biology
- Biochemistry
- Developmental biology, embryology
- Archaeology and Heritage Science

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