

# **POPULATION IMAGING**

## **TECHNOLOGY SPECIFIC REVIEW CRITERIA FOR EURO-BIOIMAGING NODES**

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## Introduction

Based on feasibility studies in relation to Population Imaging, the following criteria, in addition to the general eligibility criteria, have been identified to be critical for providing efficient access to the technology. Applications for the Euro-BioImaging Nodes will be evaluated based on the general and technology specific review criteria.

### Technology Specific Criteria and Resources:

Technology specific review criteria refer to the resources that are either required or desirable to enable user access to medical imaging technologies in Euro-BioImaging Nodes. **At the time of the expression of interest to become a Euro-BioImaging Node, resources described here can be already provided by the institution or consortium, or are planned to be established as part of Euro-BioImaging Node construction. In order to assist evaluation of the expression of interest, each Node applicant is invited to provide as many of the mentioned resources as possible. However, Eols of technology providers who plan to only offer a selection of these resources will also be considered.**

In the framework of Euro-BioImaging, it is expected to have considerable diversity between medical imaging users, depending on their expertise and availability of certain technology at their home institution. In order to successfully host all users, a node should provide an infrastructure together with **specialty trained and experienced staff** who will support the user in project planning, protocol optimization, patient or subject recruitment, data acquisition & storage, data processing, analysis & interpretation and who will enable users to utilize the facility in the best possible way. This mandatory comprehensive support will also ensure that data is recorded under optimal technical conditions.

### Types of Nodes:

Population Imaging Nodes as **Single Technology Flagship Nodes** will offer the infrastructure at European leading level.

The population imaging infrastructure called for in Part B contains three interconnected main parts: 1) image collection platform facilities 2) access to image handling platforms for Euro-BioImaging users and 3) access to image data for Euro-BioImaging users. The main aim of the Euro-BioImaging Node is to support harmonized image collection, analysis and data sharing. Furthermore the Node will support the harmonization (share SOPs) for data acquisition for population based imaging. The data for this Flagship Node may have been obtained by different imaging acquisition technologies.

# Technology Review Criteria for Population Imaging Euro-BioImaging Nodes

## *Population Imaging*

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1. The Node will provide Standard Operating Procedures (SOP), image protocols, quality control, data storage, data analysis and make data access available.

2. The local imaging facilities normally serve an epidemiological cohort in the vicinity of the image facility. It is not the main aim of the imaging facilities to provide open access to remote cohorts or studies but each facility give access to image acquisition for local epidemiological cohorts.

The purpose of the Node is to **support users at all levels in the design and execution of a population imaging study**. Support includes **access** to optimized imaging protocols, quality assurance protocols, data management and handling protocols, automated image analysis pipelines of large data sets, data mining infrastructure, evaluation tools (e.g. for statistical analyses and presentation of results or correction of systematic errors during image acquisition), ethical issues protocols. **Experienced staff to support and educate users** in all these activities will be necessary. Support and education for optimization of imaging protocols, quality assurance protocols, and data acquisition can be provided at the imaging facility of the user. This includes users who acquire image data , and who wish to use the data and the image analysis infrastructure of the Node.

3. Population Imaging projects last several years due to the inclusion of thousands of participants, to the serial (longitudinal) acquisition of imaging data and clinical or metadata, and to the assessment of clinical endpoints during a long follow-up period. In addition, the wealth of information in the imaging data leads to repeated analysis of the imaging data with new algorithms and new methodologies. This may require a longstanding use of the image analysis infrastructure at different stages of the project. **Therefore, the Node must have in place 1) data storage capabilities able to receive and store imaging data and to provide remote access to imaging data (and vice-versa) 2) high performance computing systems.**

4. Semi-automated image analysis requires a pipeline of validated algorithms for different tissues/structures/organs. **The Node provides physical or remote access to a broad selection of validated image analysis algorithms interconnected into pipelines. Experienced staff to support in the execution of the image analysis pipeline is available.** Semi-automated image analysis requires frequently visual evaluation of results and manual adaption of registrations and segmentations. Users are trained to perform these tasks. It is not the staff who is executing these quality checks.

5. The Node **has regulations in place for submission of and access to image data and other relevant data acquired in the population cohort studies**. Access to image data may require visits of the user to the Node and on site analysis in case image data can only be accessed physically due to local data protection regulations.

## Overview of Technology Review Criteria for Population Imaging Euro-BioImaging Nodes

Type of Node		Modality	Facilities			Training					
Multi-modal	Flagship		1. Workstations - Desk, ICT access	2. Data Storage - images	3. Accommodation	4. Methodological set up	5. Facility Induction	6. Technical assistance to run instrument	7. Image processing and analysis	8. Project planning	
			<b>Priority</b>								
	Yes	<b>Population Imaging</b>	High	High	Med.	Med.	Med.	High	High	High	