



# CALL FOR PHRT PIONEER IMAGING PROJECTS

January 28, 2021

## Executive Summary

Medical imaging, either at the macroscopic scale with techniques such as MRI or PET or at the microscopic scale, plays a key role in the diagnosis of pathologies as well as in the follow-up of treatments. Each ETH Domain institutions has already well established competencies in image (data) acquisition and in their analysis. However, there is only little activities across institutional borders so far. The aim of this call is to set up a sustainable core competence in personalized medical/clinical imaging in the ETH Domain.

Within the first period of PHRT funding, a budget envelope of CHF 2 millions was allocated for the development of these competencies. This document sets out the framework for the attribution and use of these funds for the enhancement of the personalized medical imaging competencies within the ETH Domain.

The hospitals/clinics remain usually the sites where these images or clinical samples will be collected.

Each ETH Domain institution is invited to prepare so-called **Pioneer Imaging Project** proposals to which PHRT, after review and approval, will contribute up to CHF 500'000 per institution project. Projects of very high quality may receive additional funding.

Requirements for Pioneer Imaging Projects (PIP):

- it must be **collaborative** between **at least two ETH Domain institutions**;
- it has to re-inforce institutional competencies in **imaging acquisition and analysis**;
- it must **use clinical images or samples** from a **hospital or clinical partner** that will be a **project partner** as well and will provide the images/samples;
- the consortium must include **scientists (including engineers) and clinicians** working with images on a regular basis;
- clinicians shall **use products / developments / achievements** of the PIP in about two years after project start;
- it will be one out of several **parts of a future multicenter Clinical Imaging Competence Hub**.

PHRT sets up a Working Group Imaging. In addition, an independent Review Board will evaluate the submitted proposals, monitor approved projects and support the collaboration with the ETH Domain institutions focusing on personalized medical imaging.

During the 2<sup>nd</sup> PHRT phase, other calls with the topics medical imaging will be launched to continue collaborations that will have been built up out of the present effort.

**The submission deadline for the proposals of the Pioneer Imaging Project call is March 15, 2021.**

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## RATIONALE

### Rationale for supporting clinical imaging research in the framework of PHRT

Medical imaging has been, for centuries, an essential tool to better understand the diseases and a critical support for the determination of medical diagnosis. At the end of the 20<sup>th</sup> Century, with the development of powerful imaging technologies such as magnetic resonance imaging (MRI), for example, and more recently with the capacity to decompose such images into different analytic parameters which can be analyzed by artificial intelligence, a new era of medical imaging has begun. This represents a particular opportunity to integrate this approach based on the so-called radiomics and pathomics, notably, with other personalized medicine technologies in a multi-omics perspective.

A budget of CHF 2 million is reserved to set up a Clinical Imaging Platform/Center/Hub within the budget of the first phase (2017-2020) of the PHRT Program. This amount of money can be allocated until Q1 2021. The principle of developing an Imaging Center/Hub has been discussed for several months within PHRT Governance Committees and a general agreement to support such a development was confirmed during the Strategic Committee and Executive Committee on 6<sup>th</sup> and 9<sup>th</sup> of November 2020 respectively. This imaging effort should be used to activate and develop the research capacities which are already in place, to reinforce the clinical imaging research and analysis within the ETH Domain Institutions, and to establish collaboration with hospitals and clinicians; the acquisition of the images, biopsies, or samples will be performed with the clinical partners or hospitals.

This document sets the base for defining the Pioneer Imaging Projects which will be supported within this framework. As previous PHRT Pioneer Projects, the idea is to integrate different types of technologies, including imaging, in personalized health/medicine research in collaboration with hospitals/clinical partners.

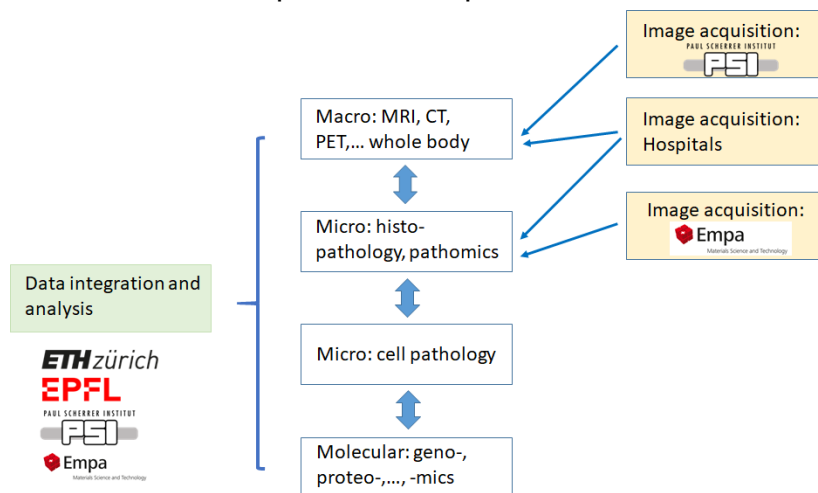


Figure 1: A concept for developing personalized imaging within the ETH Institutions

## Objectives

The aim of the PIPs is to enhance the development of imaging technologies including analyses within the ETH Domain to offer to hospitals and clinical partners improved, more efficient, quicker, and/or easier handling of clinical image-based processes (i.e. diagnosis, surgery, therapy, etc.). Therefore, real human clinical data (images or tissues to be analyzed by imaging techniques) must be used (proof of concept) at least towards the end of the PIP.

In order to make use of the wide range of know-how and competencies within the ETH domain and to ensure the continuation beyond 2024, a PIP must involve at least two ETH Domain institutions (or e.g. the SFA SDSC).

It is expected that a multi-centric Clinical Imaging Hub present in the four ETH Institution will emerge from the PIPs supporting innovative research in the analysis of clinical images.

## Funding

In the budget of the PHRT Period 2017-2020, a budget envelope of CHF 2 million was planned to set up the development of a medical imaging center within the ETH Domain Institutions.

As decided by the PHRT Executive Committee, each ETH Domain Institution is entitled to receive up to CHF 500'000 to implement a Pioneer Imaging Project (PIP). This funding is invested to support the institution's development of capacities, technologies and collaborations with other ETH institutions as well as research activities in each institution in the field of medical imaging for the second PHRT Period 2021-2024. The duration of PIPs is maximal 2 years. Continuation of Imaging Projects with new funding is planned after a PIP review to consolidate the development of imaging activities.

The funding shall cover mainly salaries for researchers/engineers, running costs of equipment, but it is not planned for acquisition of large equipment. A certain amount can be allowed for external "clinical services" with the clinical partner/hospital.

**It is planned that each of the four ETH Institutions will receive at least CHF 500'000 funding. In case of very high quality projects, the Imaging Review Board can recommend to allow additional funds.**

## OPERATIONAL

### PHRT Working Group on Clinical Imaging Analysis and future multi-centric Clinical Imaging Hub

Within the ETH Domain institutions, several research groups are specialized in the field of imaging (data) acquisition and imaging analysis. For the ETH Board and to achieve the goals, it is crucial to collaborate across institutions. This allows to generate synergies and eventually consolidate a respective multi-centric Clinical Imaging Competence Hub beyond the PHRT lifetime, i.e. 2024.

Therefore, the PHRT Working Group on Clinical Imaging Analysis (WG Imaging) is being created to guide the development of the multi-centric Clinical Imaging Competence Hub including the respective community of researchers, engineers and clinicians active in the field of medical/clinical imaging.

The missions of the WG Imaging will be:

- To ensure the guidance and the monitoring of the Pioneer Imaging Projects,
- To make recommendations for calls or initiatives supporting clinical imaging analysis in the ETH Domain institutions
- To support the PHRT Office and PHRT EC to organize regular (approx. every 6 months) meetings to report about progress and difficulties.
- To promote inter-institutional collaborations
- Each member shall act as an ambassador/promoter in its own institution.

The WG Imaging is initiated by one representative of each PHRT institution:

- EMPA: Alex Dommann
- EPFL: Michael Unser
- ETHZ: Ender Konukoglu
- PSI: Damien Weber

Each institution delegates three members to ensure a balanced representation, both, in term of range of (sub)topics to be covered, but also in terms of institutions. The broad range covers:

- the macroscopic scale (radiological human body examination by techniques such as X-ray, PET, MRI or radiotracers or other), and
- the microscopic scale (at the level of human tissues, cells or below).

Governance and terms of reference of the WG Imaging Group will be specified in a dedicated document.

Meetings of the Working Group will be organized as needed. They will be called by the PHRT Office which is at the WGs disposal.

## **PIP Proposal Submission: Formal Proposal**

Each institution is invited to submit at least one full proposal by 15 March 2021 to the PHRT Office. All proposals complying with the formal requirements will be reviewed by a dedicated independent Imaging Review Board, the PHRT EC will finally approve the PIPs.

## **Specifications for the Pioneer Imaging Project Proposals**

Each PIP must be led by the principal investigator who is employed by the ETH Domain institution (the leading institution). S/he is responsible to compose the consortium and the proposal (with a full cost budget), after adaptation and approval to implement the project plan (i.e. to achieve aims and milestones defined in the proposal) and manage the finances. As the PIPs are inter-institutional, a given institution will receive funding from more than one PIP. Appropriate legal/regulatory/ethics document will have to be set up and signed in priority.

Data must be transferred/exchanged via SPHN BioMedIT structure.

## Structure of the proposal:

The project must adhere to the following conditions:

1. addressing a medical/clinical question
2. enhancing precision (personalized) medicine in terms of diagnosis, prognosis, therapeutics of patients
3. leading to a concrete application in the clinic by the project end, i.e. direct application of results to patients or ready to launch a validation study to qualify for clinical trials
4. supporting the development of a multicenter Clinical Imaging Competence Hub within the funded ETH Institutions
5. be part of a collaboration between ETH institutions and hospitals/clinical partner which will provide the research material (images, data, tissues...)
6. setting the basis for sustainable activities beyond the period of funding
7. contributing to an industrial development would be beneficial

In other words

- it must be **collaborative** between **at least two ETH Domain institutions**;
- it has to re-inforce institutional competencies in **imaging acquisition and analysis**;
- it must **use clinical images/samples** from a **hospital/clinical partner** that will be a project partner as well – **bridging to the clinic** is the mission of PHRT;
- the consortium must include **scientists (including engineers) and clinicians** working with images on a regular basis;
- clinicians shall **use products / developments / achievements** of the PIP in about two years after project start;
- it ideally involves the Swiss Data Science Center (SDSC)
- it will be one out of several **parts of a future multi-centric Clinical Imaging Hub within the ETH Domain**.

In order to develop new approaches for clinical imaging within personalized medicine, PHRT fosters PIP on a broad range (e.g. new technologies and methods of image acquisition, recording, processing and analysis of imaging data, samples leading to image development, new use of images for advancement of medicine, etc).

Imaging data transmitted from the clinical partners must use the BioMedIT infrastructure of the Swiss Personalized Health Network (SPHN).

## Duration

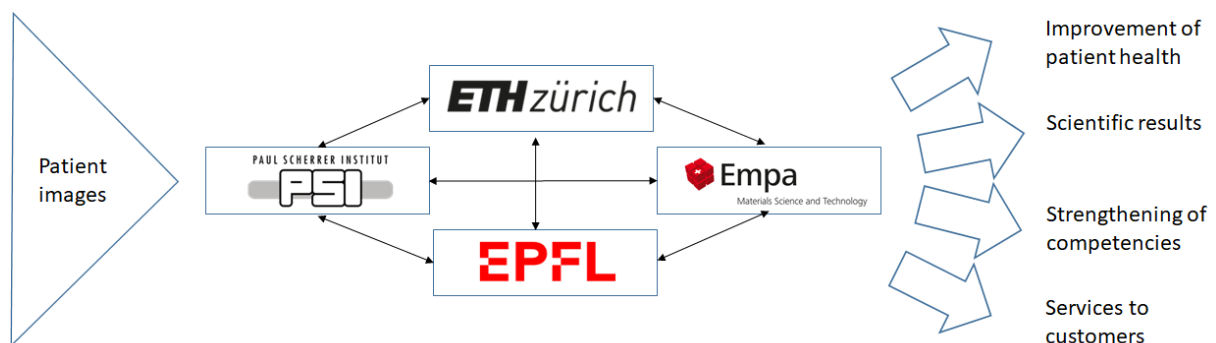
The duration of the project is up to **two years** (up to Q2 2023).

As a pilot, PIP shall explore strategies, approaches, methods and options for a new Clinical Imaging Hub in the ETH Domain. **Further PHRT imaging calls will be published** later. During the second PHRT phase, the PIPs shall transform into a multi-centric Clinical Imaging Hub that will sustain after PHRT comes to its end in 2024.

## Expected achievements

A PIP will be regarded to be successful if it demonstrates:

- a strong core competence in imaging acquisition and analyses for personalized medicine
- a smooth collaboration within the consortium of ETH Domain institutions and hospitals or clinical partners
- that achievements (e.g. analysis methods) are applied for a clinical question or in clinics for the benefit of patients.
- an imaging analysis services (or product) which is proposed to hospitals/clinical partners or to the pharmaceutical industry



*Figure 2: Value creation with the Pioneer Imaging Projects within the ETH Domain institutions*

## IMPLEMENTATION

### Timelines

- |  |       |          |      |
|--|-------|----------|------|
| • Publication of call                    | 27    | January  | 2021 |
| • Kick-off initial Working Group Imaging | Early | February | 2021 |
| • Submission of the proposals            | 15    | March    | 2021 |
| • Decision on the proposals              | 03    | May      | 2021 |
| • Start of the PIPs                      | 01    | June     | 2021 |

### Imaging Review Board

The WG Imaging will nominate an external Review Board whose members will assess the proposals and make recommendations on the projects to the EC for approval.

### Communication

The launch of the Pioneer Imaging Project will be communicated on PHRT website, on twitter and other communication channels after approval by PHRT Executive Committee.



## DOCUMENTATION TO BE SUBMITTED

The PHRT Pioneer Imaging Project proposals are to be submitted using the official templates, which are available on the [PHRT website](#), consisting of three parts:

### Part 1: General information

### Part 2: Scientific and technical information

- a. Summary: concise statement of the goals, milestones and significance of the project (1-2 pages)
- b. International standing of all applicants in their fields of research (max 2-3 pages in total)
- c. Project plan (maximum 5 pages in total; CVs and references not included). **Note:** any pages exceeding 5 will not be considered).
  - c.1. Background and state of the art relevant to the project
  - c.2. Goals of the project: explanation of the clinical question(s) including relation to the clinical samples
  - c.3. Clinical samples or images: IRB (ethical) approval obtained or planned, number of subjects providing samples/images, state and quality of the samples/images, metadata, additionally available data and information.
  - c.4. Data management (integration/implementation), strategy of data processing. SPHN BioMedIT infrastructure should be used.
  - c.5. Description of the consortium, role of the main and co-applicant
  - c.6. Expected impact and significance
  - c.7. Bibliography
- Attachments:
  - CV and publication list of the past 5 years of all main and co-applicants.
  - Potential reviewer (positive and negative list)
  - Link to any other SPHN or PHRT projects approved prior to this one: please explain the relation of the proposal to approved projects if there is any.

### Part 3: Full cost budget (using the [PHRT financial forms](#))

Adherence to the current valid version of the [Ethical Framework for Responsible Data Processing](#) is mandatory to apply for both PHRT and SPHN funding. Applicants should consult the PHRT webpage for information about the newest version of the Ethical Framework for Responsible Data Processing.

*Please, note: Use of the official PHRT forms and completeness of the proposal, written in English. The selection of the proposals will be preceded by a formal check by the PHRT office. Proposals which fail to comply with the formal requirements will not be admitted to the next stage of the selection procedure and will be rejected if the defect cannot be easily remedied.*

**IMPORTANT: All agreements (data transfer and usage agreements, material and transfer agreements, consortium agreements, etc.) must IMPERATIVELY be signed within 3 months of the start of the project.**

### **Submission Deadline**

Pioneer Imaging Project proposals are to be submitted in PDF format by

**March 15, 2021.**

The proposal must be sent to [phrt-office@ethz.ch](mailto:phrt-office@ethz.ch).

### **Selection criteria**

The PHRT Executive Committee will evaluate the proposals according to the conditions described above and the recommendation of the Imaging Review Board.

### **Annual scientific/technical and financial reporting**

The annual scientific progress as well as financial reports of each PHRT project are to be submitted to the PHRT Office once a year. The reports will be consolidated and reviewed. Financial and scientific reporting is to be provided according to defined directives.