



Strategic Focus Area

**Personalized Health  
and Related Technologies**

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# 7<sup>th</sup> Call for Proposals for PHRT Projects: Personalized Health / Personalized Medicine Research Projects (PH/PM Research Project) January 15, 2022

In its strategic plan for the ETH Domain, the ETH Board defined “[Personalized Health and Related Technologies](#)” (PHRT) as one of its Strategic Focus Areas (SFA). PHRT is focused on core contributions by the ETH Domain institutions in the field of personalized health and personalized health technologies that are complementary to the efforts undertaken by other initiatives within the ETH Domain such as the SFA [Swiss Data Science Center \(SDSC\)](#) and programs outside the ETH Domain such as the [Swiss Personalized Health Network \(SPHN\)](#). An essential goal of PHRT is to put ETH Domain institutions in a position to most fruitfully collaborate with clinical (research) partners, including those from SPHN and from leading international programs. In addition, the PHRT aims to develop synergies with the SFA SDSC, e.g., through the development of computing infrastructure for managing and analyzing the large amounts of data required in personalized health or by the development of high-performance computing/data science technologies focused on health-related problems. The [Overview document](#) is an integral part of this call for proposals.

All faculty members and senior scientists employed at an institution of the ETH Domain, i.e., at Empa, EPFL, ETHZ, PSI, Eawag, or WSL, are eligible for PHRT funding. He/she will act as principal investigator (PI) and coordinate the consortium (if there is one).

Collaboration with “non-ETH Domain” scientists, especially with clinical groups from universities, university hospitals, and clinical institutions, is highly recommended and desired. However, the ETH Board has ruled that PHRT funds can only be received from researchers of the ETH Domain and must be spent within ETH Domain institutions with a few well-defined exceptions. A contract must be set up to regulate the service for each exception. Therefore, such proposals must submit a total cost budget indicating which parts (research groups and activities) are funded from various funding sources (PHRT - ETH Domain, SPHN - universities, university hospitals, clinical institutions, own contributions, [IICT](#) of the SNSF etc.). In particular cases, e.g., access to -omics or clinical data can be organized **as a clinical service** via the cost category “consumables” in the PHRT budget. Note: clinical services should be maximal 20% of the total PHRT budget. If they exceed 20%, a sound justification must be given.

Applicants are encouraged to submit project proposals that collaborate with the [Swiss Data Science Center \(SDSC\)](#).

PHRT intends to close the patient-research-patient cycle and show how ETH technologies/algorithms can be leveraged to support clinical decision-making. Therefore, the PHRT EC and international reviewing committee will emphasize the decision-making process for project funding on project plans, which go beyond the publication of the research results. Please describe in detail how your research plan and expected results can be leveraged together with clinicians at the interface to the clinic and patients. In case the project is designed and not yet at the level of making the transition to the clinic, the apparent path towards clinical implementation, including clinical partners for implementation must be described.

Furthermore, the generated data must follow [the FAIR principle](#), e.g., the data must be findable, accessible, interoperable, and re-usable with none or minimal human intervention. Here, PHRT expects an effort beyond the typical requirements of publication. Data lineage tracking, using community accepted data exchange formats, and the inclusion of meta-information for export/import into PHRT/SPHN data centers is expected. Please visit the PHRT website and/or contact the PHRT office for further information and guidance.

Typically, PH/PM research projects require various approvals (e.g., ethics) and/or **agreements** (e.g., Data Transfer and Use Agreement (DTUA)). To successfully continue the projects and receive continued funding from PHRT, all necessary documents **must be available and signed three months after the project start, and a copy must be submitted to the PHRT office**. In the case of missing permissions/documents, the project will be put on hold. An overview and templates for various agreements can be found on the [SPHN-DCC website](#). Please do not hesitate to contact the PHRT office for further guidance and clarifications.

## 1 Introduction

The primary objective of personalized medicine is to recognize a human disease or disease treatment as a complex system and achieve an integral and comprehensive understanding of this system that will lead to optimizing treatment for each individual.

This may involve

- (1) the collection and integration of various quantitative datasets obtained at multiple scales (from the molecular and cellular to the individual human scale),
- (2) the development and application of data-driven approaches that identify patterns in such datasets that have predictive power in the prognosis of disease outcomes or the effect of treatments,
- (3) the generation of mathematical models integrating data and making predictions, e.g., about treatment outcomes or disease trajectory, and
- (4) medical-related technology is used to diagnose and monitor health status and treat diseases.

The study of disease systems in this framework requires interdisciplinary cooperation and the division of labor between basic scientists, computer scientists, engineers, statisticians, scientists practicing translational medicine, and clinicians. The present call for proposals is based on this definition of personalized medicine.

In this call, PH/PM research project proposals will be prioritized that:

- study a human disease as a complex system, generating and/or using various types of data
- focus on systems approaches to medical and/or clinical questions
- combine both basic and clinically-relevant research
- use quantitative approaches and integrate large, complementary datasets (either existing or newly collected) describing dynamic medical systems
- contribute to validating a technological infrastructure (as part of a Driver/NDS project within SPHN)

**NOTE:** Please read these guidelines carefully and follow the instructions; please note that applications that do not meet the formal requirements will not be further evaluated

## 2 Description of PH/PM Research Projects

The interdisciplinary research projects will be carried out by consortia composed of a moderate number of research groups (typically 3 to 6) with complementary expertise. Applications for projects that bridge institutional and scientific discipline boundaries are particularly encouraged. However, the ETH Board has ruled that PHRT funds can only be received from researchers of the ETH Domain and must be spent within ETH domain research institutions with a few well-defined exceptions. A contract must be set up to regulate the service for each exception. Therefore, as a rule, proposals that include applicants from outside the ETH Domain will be required to submit a total cost budget indicating which parts (research groups and activities) are to be funded by which funding source (PHRT - ETH Domain, SPHN - universities, university hospitals, own contributions, SNSF, etc.). In particular cases, e.g., access to -omics or clinical data can be organized **as a clinical service** via the cost category “consumables” in the PHRT budget. Note: clinical services should be maximal 20% of the total PHRT budget. If they exceed 20%, a sound justification must be given.

The principal applicant is responsible for the whole project proposal and will act, if the proposal is funded, as Principal Investigator (PI) who coordinates the co-PIs. PHRT suggests coordinating the project through a dedicated project manager. Projects must show an interdisciplinary character by linking research groups from traditionally separate disciplines. Each research group must explain its role, contribution, and specific value to the consortium. Potential proposals may cover a wide range of research methods, technologies, and development tools. Therefore, PH/PM Research Projects with different scopes can be envisaged.

The following descriptions are only meant to serve as examples:

- **Interdisciplinary research projects that study a disease process as a complex system.** This type of project might concentrate on the in-depth (mechanistic) analysis of a specific disease system or multiple systems using a systems approach. Projects should preferably demonstrate that they are implementing an integrated experimental and theoretical technology/research approach aimed at a comprehensive, quantitative understanding of complex processes underlying disease. It is expected that such projects will culminate in tangible translatable advances in the specific disease area, e.g., by the development of mechanism-based biomarkers or treatment options or by using data from existing cohorts.

- **Interdisciplinary research projects with a technological and/or engineering focus.** To overcome the substantial technological limitations of personalized medicine, PHRT will support integrated projects that target the development and implementation of novel and innovative technologies. Such technologies must possess the potential to overcome a documented limitation and broadly impact research in a wide range of disease systems. Technology-oriented projects focused on data collection must be cutting-edge and adhere to the idea of standardized data formats and verifiable data quality. Examples of technologically-oriented projects include new approaches to the acquisition of data from human individuals, their tissues or extracted cells, the development of in vitro model systems from human patients that are disease-relevant (e.g., biopsies, organoids, stem cells), new technologies for the computational analysis of such data, or integration of (quantitative) data sets and technologies for the targeted perturbation of disease-relevant model systems.

In reality, most PH/PM Research Projects will be a mix of the types described above. However, each project must contain substantial quantitative work in the context of medical and, ideally clinical research using cutting-edge technology.

A PH/PM Research Project will be proposed and led by one principal applicant. His/her institution, the host institution of the project, will be responsible for the administration, coordination, and reporting within the project. If a proposal is approved, the principal applicant will manage (probably with the support of a project manager) his/her project and ensure that it is carried out in a state-of-the-art manner. Generally, the project consortium should consist of researchers from at least two institutions, preferably including hospitals.

#### Technicalities:

Project duration	36 months PHRT funds must be used until December 31, 2025
PHRT funding (max.)	CHF 2,000,000 in total for personnel, equipment, consumables
Number of research groups	typically 3 to 6 from different complementary disciplines
Number of approved projects with this call	approx. 5
Total cost budget consists of different funding sources	<ul style="list-style-type: none"> <li>a) funding requested from PHRT</li> <li>b) matching funds from the university/university hospital partner institutions in cash and/or in-kind</li> <li>c) others: funds directly linked to the project obtained from competitive research institutions such as SNSF, CTI, EU, NIH, etc.</li> <li>d) private funds: collaboration with partners from private industry and SMEs</li> </ul>
Scope	Clinically relevant
Starting date	August 2022

### 3 Documentation to be submitted

The PHRT research 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: a 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 20 pages in total. **Note:** any pages exceeding 20 will not be considered).
  - c.1. Background and state of the art relevant to the project
  - c.2. Goals of the project: demonstrate how the project contributes to the development of the PH/PM research in Switzerland
  - c.3. Work Packages (if there are), milestones, and deliverables
  - c.4. Methodology and approach
  - c.5. Project implementation
  - c.6. Data management (integration/implementation)
  - c.7. Role of the applicants and associated applicants
  - c.8. Research requiring authorization or notification
  - c.9. Relevance and impact for PH research in Switzerland
  - c.10. 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 SPHN or PHRT projects approved in 2017: 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 currently valid version of the [Ethical Framework for Responsible Data Processing](#) is mandatory to apply for PHRT funding. Applicants should consult the PHRT webpage for information about the newest version of the Ethical Framework for Responsible Data Processing.

#### Submission Deadline

PH/PM Research proposals are to be submitted in PDF format by **April 17, 2022**

## 4 Selection criteria

The review board will evaluate the proposals according to the following criteria:

- Contribution to the progress of personalized medicine, including interoperability of generated data;
- Added technological and scientific value due to the interdisciplinarity of the proposal.

In addition to these criteria, the following standard scientific criteria will apply:

- Scientific relevance of the proposal
- Originality of the questions
- Adequacy of the methodology
- Scientific track record of the applicants
- Expertise of the applicants concerning the proposal
- Feasibility of the proposal
- Suitability of the technology
- Clinical implementation
- Data integration plan
- Project must make a difference in personalized medicine/health
- Co-operation with clinics/patients
- Translational, i.e., medically/clinically relevant (consortia connecting with University Hospitals are encouraged)
- quality of the consortium

The decision to grant projects will be based exclusively on scientific criteria. This means that the approved projects must (1) add value to systems medicine, including providing interoperable data to the PH community, and (2) represent high scientific quality. If a substantial part of a proposed research project does not meet these criteria, the whole project will be rejected.