SystemsX.ch
The Swiss Initiative in Systems Biology

12th Call for Proposals for SystemsX.ch Projects

The Federal Council proposed to provide funds to the SystemsX.ch initiative to foster systems biology research in Switzerland in its *Messages on Education, Research and Innovation* for *2008-2011, 2012,* and *2013-2016*, which were approved by the Swiss Parliament. This is the twelfth call for proposals of the Swiss Initiative in Systems Biology.

Summary

The 12th Call for proposals of SystemsX.ch invites proposals for Special Opportunities projects that promote systems biology research in the broader sense, including technology development. SystemsX.ch will come to an end in 2018. Funding will be awarded to successful applicants for a one- to two-year project between 2015 and 2018. Scientists from all SystemsX.ch partner institutions are encouraged to apply. The Special Opportunities project type focuses exclusively on high-risk projects that aim to establish a novel proof-of-principle or a prototype of novel technology or software. Submission deadline in **May 17, 2015**.

Content

1 What is Systems Biology?

The primary objective of Systems Biology is to achieve a **comprehensive understanding of the quantitative behavior of biological systems** arising from the dynamic interplay of its components. More often than not, systems biology research projects culminate in a model (e.g. mathematical) that simulates *in silico* the system's properties and predicts its quantitative response to internal or external perturbations. Frequently, biological systems are represented as networks of interacting elements, whereby the structure and dynamic behavior of the network determine its phenotypic traits. The study of biological systems in this framework requires interdisciplinary cooperation and the division of labor between biologists, medical scientists, mathematicians, physicists, computer scientists, chemists and engineers.

2 What is SystemsX.ch?

SystemsX.ch is a simple partnership which enables institutes, competence centers, and scientific research groups to interact and cooperate by establishing common technological platforms and sharing collected data. The members of this partnership, i.e. the partner institutions, aim to position Switzerland among the world leaders in systems biology. SystemsX.ch will enhance and extend interdisciplinary research and education at the highest level in this field. It will develop and use the knowledge and tools necessary to expand our understanding of and ability to teach biology as an integrated quantitative science. It will foster the ongoing design, development, and application of advanced technology and the training of scientists and engineers in the special skills required to understand biological systems.

To achieve its ambitious goals, SystemsX.ch relies on the creative talents of its scientific and professional staff, and its ability to initiate and nurture partnerships between different SystemsX.ch projects and with other academic institutions, hospitals, private industry, and society. As a result of the first phase of SystemsX.ch (2008-2012), around 125 SystemsX.ch projects were approved, involving more than 250 research groups and more than 1'000 scientists. The main part of the effort has gone into the 14 large, integrated research projects (RTD) and SyBIT, the SystemsX.ch IT backbone. The second SystemsX.ch phase started in 2013 with 20 new RTD projects, 9 MRD projects and 8 Transfer Projects. In addition, the SystemsX.ch community encompasses all students, technicians and scientists involved in the Transition Postdoc Fellowships (TPdF), the Interdisciplinary PhD (IPhD) projects, as well as the former Interdisciplinary Pilot projects (IPP) and the Bridge-to-Industry projects (BIP).

The overall goal of the second phase (2013-2016+) is to sustain and reinforce the scientific and cultural advances realized in the first phase, to further expand and strengthen the systems biology research community in Switzerland and to expand the systems biology approaches into new scientific directions and into the private sector, with a particular focus on medically and clinically relevant systems biology research. Accordingly, the available funds will be distributed to support new projects after peer review organized by the SystemsX.ch Scientific Executive Board (SEB).

You will find more information on the SystemsX.ch website: www.systemsx.ch.

2.1 Goals of SystemsX.ch

SystemsX.ch, the Swiss Initiative in Systems Biology, aims to:

- gather scientific competences on a national level to place Switzerland at the forefront of systems biology research with a particular focus on quantitative and predictive biology,
- set up and develop the cutting-edge technology required for systems biology research,
- implement a truly interdisciplinary research culture by connecting complementary disciplines to stimulate collaboration,
- establish collaborations with private industry and SMEs in various and individual forms of public-private partnership,
- educate PhD students, postdocs and young researchers for the future,
- facilitate systems-approach research in medical and clinical domains.

SystemsX.ch fosters interdisciplinary collaboration, promoting the systems approach in life science research between both public and private institutions. Public institutions are universities, public and university hospitals, and research institutions in compliance with paragraph 16 of the Swiss Research Law (420.1). Examples of private institutions include companies (industry), small- and medium-sized enterprises (SMEs) and private hospitals. According to applicable law, SystemsX.ch funds from the Swiss Government may only support public sector research.

2.2 Scope of 12th Call for Proposals

SystemsX.ch will support innovative, high-risk, novel projects that comply with the above definition of systems biology. With the present 12th call for proposals, SystemsX.ch invites scientists from SystemsX.ch partner institutions to apply for funding for Special Opportunities projects.

In this call, Special Opportunities projects will be prioritized that:

- promote systems biology research in the broader sense, including technology development
- are high-risk, high-gain projects
- aim to establish a novel proof-of-principle or a prototype of novel technology/software
- include the private sector

A total of **CHF 1'500'000** will be made available for Special Opportunities projects.
The **submission deadline** for the proposals of this 12th call is **May 17, 2015**.

2.3 Additional information

Additional information about SystemsX.ch may be found at www.systemsx.ch. Please contact the SystemsX.ch Management Office if you have any further questions (admin@systemsx.ch; 044 632 74 23).

3 Special Opportunities projects

Special Opportunities projects are - compared to other SystemsX.ch projects - rather small-scale systems biology research projects with a strong innovative character. They may entail the development of technology or software. These high-risk, high-gain projects may be funded for one to two years.

A SystemsX.ch Special Opportunities project is to be proposed and led by one main applicant, with or without co-applicants. The institution of the main applicant will be responsible for the administration, coordination, and reporting of the project. If a proposal is approved, the main applicant will manage his/her project and ensure that it is carried out in an appropriate manner.

The projects will be reviewed by the SystemsX.ch Scientific Executive Board (SEB). External reviewers (international experts) may be invited to give an additional written review.

3.1 Special Opportunities project characteristics

Systems biology covers a wide range of research methods, technologies and development tools. Therefore, Special Opportunities projects with a variety of different scopes can be envisaged. Some examples might be: the establishment of a novel proof-of-principle, the development of a novel technology, or the development of novel software to solve an unmet need. The projects must be highly innovative and not qualify for other traditional sources of funding, such as SNSF or European grants, for instance.

SystemsX.ch defines an upper limit on duration and available SystemsX.ch funds (see next section).

3.2 Duration, finances

For Special Opportunities projects, the duration will be **one to two years** without the possibility of further extension. SystemsX.ch will fund each successful Special Opportunities project with a **maximum of CHF 200'000**. Funds can be only be spent before December 2018. As required by law, and in accordance with the Messages of the Federal Council on Education, Research and Innovation, **participating institutions may additionally provide their own**

contributions (in cash and/or in kind) to match the funds provided by SystemsX.ch, but are not obliged to. Guidelines on the calculation of matching funds and allowable matching fund sources can be found below in section 3.4.

Moreover, additional funding from both competitive research foundations (SNSF, CTI, EU, NIH, etc.) and from the private sector (industry, SMEs, etc.) can also contribute towards Special Opportunities projects. Therefore, Special Opportunities projects may be part of a larger project, or synergistic with another project, but this is not a requirement.

The budget for a Special Opportunities project must include details of:

- Funding requested from SystemsX.ch

And may also include one or more of the following three optional funding sources:

- Own contributions: matching funds from the partner institutions (1) in cash and/or (2) in kind (see definitions below)
- Private industry: collaboration with partners from private industry and SMEs
- Others: funds directly linked to the project obtained from other competitive research institutions such as SNSF, CTI, EU, NIH, etc.

3.3 Own contributions

If “own contributions” are provided for the project, they may be included in cash and/or in kind.

Definitions

cash: funds are to be transferred to the account of the research group in question and reported in the annual financial report of the institution.

kind: resources from the institutions' operating budget allocated explicitly to SystemsX.ch projects in the form of:

(1) Personnel paid from the institution's operating budget involved in SystemsX.ch projects according to the following table:

Table “in kind”: lump sum per category (including salary, social charges, overhead services, infrastructures) to be calculated pro rata (max. of 20% for professors). Note: for clinicians and medical doctors, lump sums will be determined based on those of equivalently experienced researchers

Professor	270 kFr
Assistant Professor	200 kFr
Senior Researcher*	170 kFr
PostDoc*	130 kFr
Technician*	130 kFr
PhD student*	60 kFr

*only if salary is paid from the institution’s operating budget

(2) From 2013 onwards: large equipment purchased from the institution’s budget is eligible for SystemsX.ch purposes on a pro rata basis.

(3) Earlier investments (e.g. infrastructure platforms made available to SystemsX.ch): should be reported in the financial report of the first year. The SEB will determine the eligible amount on a case-by-case basis.

3.4 Who may apply for Special Opportunities projects?

All researchers working at SystemsX.ch partner institutions are eligible as main applicants. Scientists from other Swiss research institutions are eligible as co-applicants (i.e. not main applicants). However, only SystemsX.ch partners and cooperating partners (according to the revised Research Law SR 420.1, Article 7, No. 4) are eligible to receive SystemsX.ch funding.

If the institution is not already a SystemsX.ch partner, the successful applicant's hosting institution must apply to become a SystemsX.ch partner prior to initiation of funding.

3.5 Documentation to be submitted

Special Opportunities proposals are to be submitted as a single PDF document. The proposals should be concise (three to five pages), and outline:

- what the project is
- why it is important for systems biology in the broader sense
- a full cost overview and project budget (own, SystemsX.ch, second and third party funds)

The proposal should include:

1. Summary: concise statement of the goals, milestones and significance of the project (maximum 1 page)
2. Research plan (maximum 3 pages)
3. Justification of the systems biology approach and description of the significance of the planned research for SystemsX.ch and future users (patients, private industry, economy, medicine, etc.) (maximum 1 page)

Annexes:

- Full cost budget (see form)
- CV and publication list covering the past 5 years of all applicants
- Existing contracts, letters of support of existing or potential industry partners, if applicable.

3.6 Submission deadline

The deadline for submitting Special Opportunities proposals is **May 17, 2015**. The proposals must be submitted as a PDF file, sent via email to admin@systemsx.ch.

3.7 SystemsX.ch selection procedure for Special Opportunities proposals

The selection of proposals will be preceded by a formal check by the SystemsX.ch Management 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. The following formal requirements must be met:

- Compliance with the submission deadline (postmark)
- Compliance of the proposal with the requirements described above, and proposal written in English
- Eligibility of the main applicant and co-applicant(s)

Proposals will be selected by the SystemsX.ch SEB. The SEB will evaluate the contributions of the submitted proposals with respect to the goals of the SystemsX.ch initiative and of this call. International experts from relevant disciplines may be asked to provide external written reviews.

The final decision is expected to be announced in July 2015. Approved projects can start in August 2015.

3.8 Selection criteria

The SystemsX.ch SEB will select the Special Opportunities proposals according to the following criteria:

I. Excellence and innovative character
II. Added value to systems biology
III. Integration of different disciplines
IV. Balanced project funding

If a Special Opportunities project does not meet these criteria, it will be rejected.

3.9 Annual scientific and financial reporting

At the end of the project, a scientific progress report of each Special Opportunities project is to be submitted to the SystemsX.ch Management Office. The reports will be consolidated and passed onto the SNSF where they will be reviewed.
The financial reports are also to be submitted to the SystemsX.ch Management Office, the following items being disclosed according to defined directives (cf. Partnership Agreement Article 38, No. 4):

- SystemsX.ch funds
- Own contributions “in cash” and “in kind” by the involved partners
- Contributions from the private sector (industry or SME)
- Additional third party funds from competitive research foundations (SNSF, CTI, EU, NIH, etc.) which support SystemsX.ch.

4 Appendix

4.1 Abbreviations

BoD	Board of Directors (all Presidents and Rectors of SystemsX.ch partner institutions)
CTI	Commission for Technology and Innovation
EU	European Union
IPhD	Interdisciplinary PhD Project
MO	SystemsX.ch Management Office
MRD	Medical Research and Development
NIH	National Institute for Health
RTD	Research, Technology and Development
SEB	Scientific Executive Board (scientists of different Systems Biology fields & partner institutions)
SME	Small and Medium-sized Enterprise
SNSF	Swiss National Science Foundation
TF	Transfer Project
TPdF	Transition Postdoc Fellowship

4.2 Partner institutions of SystemsX.ch as of March 2015

ETH Zürich (leading house)
EPF Lausanne
Friedrich Miescher Institute
Paul Scherrer Institute
Swiss Institut of Bioinformatics
University of Basel
Università della Svizzera Italiana
Zurich University of Applied Sciences
University of Bern
University of Fribourg
University of Geneva
University of Lausanne
University of Neuchâtel
University of Zurich
IBM Zurich Research Laboratory