



**SystemsX.ch**

The Swiss Initiative in Systems Biology

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## **3<sup>rd</sup> Call for Proposals for SystemsX.ch Projects**

In its *Message on Education, Research and Innovation for 2008-2011*, the Federal Council has proposed to provide funds to the SystemsX.ch initiative.

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# 1 What is Systems Biology?

The primary objective of Systems Biology is to achieve a **comprehensive understanding of the quantitative behavior of biological systems** that arises from the dynamic interplay of its components. It is expected that Systems Biology research projects will culminate in a mathematical model 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 the dynamic behavior of the network determine its phenotypic traits. The study of biological systems in this framework requires interdisciplinary cooperation and a division of labor between biologists, medical scientists, mathematicians, physicists, computer scientists, chemists and engineers. The present Call for Proposals is based on this definition of Systems Biology.

## 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 the data collected. The members of the partnership, i.e. the partner institutions, intend 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 goals, SystemsX.ch relies on the creative talents of its scientific and professional staff and its ability to initiate and nurture partnerships between the projects associated with the program and with other academic institutions, private industry, and society.

### 2.1 Goals of SystemsX.ch

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

- gathering scientific competences on a national level to establish Switzerland at the forefront of the Systems Biology research;
- setting up and developing the cutting-edge technology required for Systems Biology research;
- implementing a truly interdisciplinary research culture by assembling complementary disciplines to stimulate mutual benefits;
- establishing collaborations with the private industry and SMEs in flexible forms of public private partnership;
- educating PhD students and young researchers for the future accordingly.

## 2.2 Scope of 3<sup>rd</sup> Call Projects

SystemsX.ch supports projects that comply with above definition of Systems Biology. After two calls, more than 60 SystemsX.ch projects have been launched since 2008: 14 large integrated research projects (RTDs), 27 student projects (IPhDs) and 20 pilot projects (IPPs). During the first SystemsX.ch phase (2008-2011) there will be no more calls for large integrated projects (RTDs).

This call encourages to submit proposals for

1. Interdisciplinary PhD student projects (IPhDs, see section 3.1): To educate the next generation of systems biology scientists, IPhD students are supervised by two mentors from different and complementary disciplines. IPhD proposals will be evaluated by an international, interdisciplinary review panel of the Swiss National Science Foundation (SNSF).
2. Interdisciplinary Pilot Projects (IPPs, see section 3.2): SystemsX.ch supports innovative projects with a high risk to scientifically fail and/or seed projects. The IPP proposals are reviewed and evaluated by the SystemsX.ch Scientific Executive Board (SEB).

Finally, SystemsX.ch aims to encourage and promote interactions between academia and industry. In addition to the normal projects SystemsX.ch funds, the SEB decided that it would create two new project types to target these interactions. These are Bridge 2 Industry and Industrial Sabbaticals in Academia (BIP and ISA) projects. Unlike the IPPs and IPhDs, the submission dates for these kinds of projects are more frequent. These projects will be reviewed and evaluated by the SEB. Unlike the IPP and IPhDs projects, submission deadlines are more frequent to allow more flexibility in preparing a proposal together with industrial partners. For more information, please see section 3.3 of this call.

## 2.3 All-SystemsX.ch Day: An Information Forum

To provide further information on this Call for Proposals and SystemsX.ch in general, SystemsX.ch will be hosting the All-SystemsX.ch Day on November 18, 2009 in Bern. The event is open to anyone interested in Systems Biology. The annual All SystemsX.ch Day is the largest event organized by SystemsX.ch and counts around 400 guests every year. It is a Swiss-wide networking and information exchange event, which attracts scientists, politicians, industry partners, and the public media. Besides being the main location where new projects are presented or proposed, it also promotes education and training opportunities in Systems Biology.

Every year there is a guest speaker invited to talk about the latest news and discoveries in Systems Biology. Additionally, researchers from SystemsX.ch projects present their projects and results. The event ends with a scientific poster competition, which recognizes the best poster with a generous award for successful PhD students or postdocs.

Please find the program and registration info under:  
<http://www.systemsx.ch/index.php?id=225&L=%273>

## 2.4 Additional Information

Additional information is available under [www.SystemsX.ch](http://www.SystemsX.ch) and the SystemsX.ch Management Office if you have any questions ([admin@systemsx.ch](mailto:admin@systemsx.ch) 044 632 74 23).

## 3 Types of proposals SystemsX.ch is calling for

### 3.1 Interdisciplinary PhD Projects (IPhD)

To support interdisciplinary research and education and to promote the future generation of systems biologists, SystemsX.ch will finance PhD positions for students pursuing research projects that integrate at least two disciplines relevant to Systems Biology. The students will be jointly mentored by investigators from two different disciplines such as computer science, engineering, nanotechnology, physics, mathematics, chemistry, biology, medicine, etc.

**Only one (1) PhD student can be employed per project.** IPhD Projects are limited in time, to three (3) years as a rule and may be extended for one (1) additional year. SystemsX.ch envisages funding up to 40 IPhD students from 2008-2011.

SystemsX.ch will grant the same amount to each IPhD-Project: salary and social charges of the PhD student as set forth in the SNSF rules, a yearly allowance of 10 kCHF for consumables and a one-time amount of 2 kCHF to cover the costs of participating to an international conference.

The present Call for Proposals will provide funds for up to 12 IPhD Projects.

#### 3.1.1 Who May Apply for IPhD-Projects?

Faculty members and senior researchers of SystemsX.ch institutions are eligible as main applicants and co-applicants. The main applicant's home institution must be a member of SystemsX.ch. Only institutions represented in the Swiss University Conference (SUK/CUS) and the ETH-Domain are eligible to receive SystemsX.ch funding.

#### 3.1.2 Documentation to be Submitted

The IPhD proposals are to be submitted using the official forms consisting of the following parts:

**Part 1:** General Information

**Part 2:** Scientific Information

1. Abstract (1 page)
2. International standing of both applicants in her/his field of research (1 page)
3. Research plan: state of the art, questions, methods, milestones (6-8 pages)
4. Expected impact on capacity building in Systems Biology (1 page)
5. Justification of the Systems Biology approach, significance of the planned research for SystemsX.ch and eventual users (industry, economy, medicine, etc.) (1-2 pages)

Annex:

- CV and publication list over the past 5 years of the two mentors

#### 3.1.3 Submission Deadline

The IPhD proposals are to be submitted by **15 January 2010** using the SNSF web platform *mySNF* ([www.mysnf.ch](http://www.mysnf.ch)). After the completion of the submission on the web platform, the thereby compiled PDF-file must also be sent to [admin@systemsx.ch](mailto:admin@systemsx.ch).

**Please note:** for the Swiss National Science Foundation (SNSF) to be able to guarantee *mySNF* access, new user accounts must be requested five working days before a deadline at the latest (from abroad: 2 weeks before the deadline).

It is the applicants' responsibility to ensure timely delivery of their proposal. SNSF and SystemsX.ch do not assume any responsibility for electronic / e-mail or any other submission problems.

#### **3.1.4 SNSF Selection Procedure for IPhD Proposals**

The selection of the proposals will be preceded by a formal check by the SNSF administration. 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 electronic submission deadline
- Use of the official forms and completeness of the proposal written in English
- Eligibility of the main and co-applicant

IPhD proposals will be selected by the Board of the Systems Biology Panel composed of the six members of the National Research Council.

- The Board will assess the proposals against the criteria specified below while taking into account the recommendations of the SEB.
- The SEB will assess the contributions of the submitted proposals to the strategic goals of the SystemsX.ch initiative and forward its recommendation to the SNSF.
- The decisions must be approved by the National Research Council.
- Note that this project is geared towards educating a next generation of Systems Biology scientists. It is, therefore, a personal grant to the PhD student chosen for this particular project. Only this student may be financed with these monies. For additional information please refer to the SNSF [ProDoc guidelines](#).
- SystemsX.ch reserves the right to decide on whether a second student has enough time to finish an ongoing project.

#### **3.1.5 Selection Criteria**

The Board of the Systems Biology Panel will select the IPhD proposals according to the following criteria:

- I. Contribution to the progress of Systems Biology and integration into the overall SystemsX.ch initiative;
- II. Added scientific value due to the interdisciplinarity of the proposal.

In addition to the above mentioned, the standard scientific criteria set forth in the SNSF Rules of Procedure (Reglement über Gesuche SystemsX.ch, 3. July 2007) will apply:

- a) Scientific relevance and topicality of the proposal
- b) Originality of the questions
- c) Adequacy of the methodology
- d) Scientific track record of the applicants
- e) Expertise of the applicants concerning the proposal
- f) Feasibility of the proposal.

The Board of the Systems Biology Panel will solicit written external reviews.

The decision will be based on scientific criteria, primarily on (1) added value to Systems Biology and (2) scientific quality.

### 3.1.6 Annual Scientific and Financial Reporting

The annual scientific progress as well as financial reports of each IPhD 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 by the SNSF Panel for Systems Biology.

Financial reporting including own contributions from the institutions, third parties will be according to defined directives (cf. Partnership Agreement Article 38, No. 4).

### 3.2 Interdisciplinary Pilot Projects (IPP)

As an emerging field of research, Systems Biology critically depends on new innovative impulses, many of which are expected to come from the interfaces of traditional science disciplines. SystemsX.ch will therefore support IPPs to catalyze the exploration of new research directions and ideas. These projects will bring together research teams from the different disciplines mentioned above to address high risk topics critical for Systems Biology. IPPs will be supported for one (1) year at most and are non-renewable. The funds granted cannot be used to hire PhD students. The applicants can be employed at different SystemsX.ch institutions.

SystemsX.ch will provide funding to IPPs in the amount of up to 120 kCHF for personnel (no PhD students), consumables, and equipment. Expenses will be paid directly by the SystemsX.ch Management Office.

The present Call for Proposals will provide funds for up to 8 IPP Projects. A next call for IPP proposals will be published in 2010.

#### 3.2.1 Who May Apply for IPP Projects?

Faculty members and senior researchers of SystemsX.ch institutions are eligible as main applicant. The main applicant's home institution must be a member of SystemsX.ch. Only institutions represented in the Swiss University Conference (SUK/CUS) and the ETH-Domain are eligible to receive SystemsX.ch funding.

#### 3.2.2 Information to be Submitted

The IPP proposals are to be submitted using the official form (cf. [IPP Proposal and Budget Forms on the SystemsX.ch website](#): General information, budget overview and budget details) that consists of two parts:

**Part 1:** General Information

**Part 2:** Scientific Information

1. Summary (1 page)
2. International standing of the applicant in her/his field of research (1 page)
3. Research plan: state of the art, questions, methods, milestones (3-4 pages)
4. Expected impact on capacity building in Systems Biology (1 page)
5. Justification of the Systems Biology approach, significance of the planned research for the scientific community and eventual users (private industry, economy, medicine, etc.) (1page)

Annex:

CV and publication list over the past 5 years of the main applicant.

### 3.2.3 Submission Deadline

The IPP proposals are to be submitted by **15 January 2010** in electronic form (PDF) to [admin@systemsx.ch](mailto:admin@systemsx.ch)

It is the applicants' responsibility to ensure timely delivery of the proposal. SystemsX.ch rejects any responsibility for electronic / e-mail problems or any other problems.

### 3.2.4 Selection Criteria

The Scientific Executive Board (SEB) of SystemsX.ch will evaluate the IPP proposals according to the following criteria:

- Formal criteria (deadline, completeness of the proposal, eligibility of the applicants)
- Focus on clearly defined biological systems and questions
- Does the proposal describe an integrated, interdisciplinary and quantitative project?
- Does the proposal catalyze novel interactions between groups in different fields of Systems Biology?
- Does the proposal generate new data and knowledge that could not be obtained by traditionally structured projects – what is the added value?
- What are the respective contributions of the different disciplines?
- What is the standing of the principal scientists in their respective fields?
- Does the project have a realistic budget and a clear leadership structure?

In addition, the standard scientific criteria will apply:

- a) Scientific relevance and actuality of the proposal
- b) Originality of the goals
- c) Adequacy of the methodology
- d) Scientific track record of the applicants
- e) Expertise of the applicants concerning the proposal
- f) Feasibility of the proposal.

The decision will be based on scientific criteria, primarily on (1) added value to Systems Biology and (2) scientific quality.

### 3.2.5 Scientific and Financial Reporting

After completion of the IPP project, a scientific and financial report is to be submitted to the SystemsX.ch Management Office and evaluated by the SNSF Systems Biology Panel.

Financial reporting including own contributions from the institutions, third parties will be according to defined directives (cf. Partnership Agreement Article 38, No. 4). *All IPP projects must be completed within two (2) calendar years after their payments have been released to avoid retraction of leftover funds.*

### 3.3 Industry Collaboration Projects (BIP and ISA)

The SystemsX.ch SEB decided to launch two new types of calls to strengthen the incentive for academia and industry to develop Systems Biology projects/ collaborations together. These kinds of project proposals will be open for submission four times per year starting on November 1, 2009. The two project types are 'Bridge 2 Industry Projects' (BIP) and Industry in 'Sabbatical in Academia' (ISA). Descriptions for both of these can be found on the [SystemsX.ch website](#) along with the corresponding submission files. We encourage scientists to use these new opportunities to open opportunities with industrial partners.

#### 3.3.1 Who may apply for BIPs and ISAs?

A BIP proposal must consist of at least one academic and one industrial partner. The academic partner must be affiliated with one of SystemsX.ch's partner institutions. An ISA must consist of at least one academic and one industrial partner. The industrial partner does not have to be Swiss or in Switzerland. The academic partner must be affiliated with one of SystemsX.ch's partner institutions.

#### 3.3.2 Documentation to be submitted

##### **For BIPs (link to further information and forms):**

**Part 1:** General Information

**Part 2:** Scientific Information

1. Summary (max 1 page)
2. International standing of the academic and industrial applicants in her/his field of research (max 1 page)
3. Research plan: state of the art, questions, methods, milestones (max 3-4 pages)
4. Budget: funds requested from SystemsX.ch, contributions by Industry, Own Contributions (matching funds) by the Institution
5. Expected impact on Systems Biology and industrial interaction in future (max 1 page)
6. Justification of the Systems Biology approach, significance of the planned research for the scientific community and eventual users (private industry, economy, medicine, etc.) (1page)

*Annex:*

CV and publication list over the past 5 years of the main applicant from academia and industry.

##### **For ISAs (link to further information and forms):**

**Part 1:** General information about the sabbatical person and the company

**Part 2:** Sabbatical plan

1. Summary (max 1 page)
2. International standing of the academic applicant in her/his field of research (max 1 page)
3. Sabbatical details: goals, scientific questions, technology and methods, milestones, timeline (max 3 pages)
4. Budget: SystemsX.ch will pay CHF 1'000 per month the sabbatical runs to cover the consumables of the industry scientist. (NO budget form required)



Additional financial requests may be submitted, but require a full cost budget including contributions made by both the industry partner and the academic institution. (2 pages max.)

5. Expected impact on collaboration with this industrial partner in future (1 page)
6. Justification of the industrial collaboration being pursued

*Annex:*

CV and publication list over the past 5 years of the main applicants from academia and industry.

### 3.3.3 Selection Criteria (Rules and Regulations)

#### **For BIPs:**

The project must involve at least one research group from a SystemsX.ch partner institution. The scientific question or technique being addressed must be relevant to Systems Biology. A sound track record of the involved groups is expected. The requested SystemsX.ch funds must be matched by the industry partner. Ideally, the academic partner can also make some additional contribution to the project (in kind or in cash).

The proposal consists of a detailed project plan including goals, questions; milestones and budget (see form). Please use the BIP-form to submit the proposal by e-mail. The proposals must be jointly elaborated and submitted. Details concerning intellectual property rights should be addressed prior to submission between the academic and industrial partners.

The submitted proposals will be reviewed by the SystemsX.ch Scientific Executive Board (SEB). The SEB will decide which proposals are accepted, and how much funding shall be granted. SystemsX.ch funds cannot flow to the industrial partner. The industrial partner does not have to be Swiss or in Switzerland.

#### **For ISAs:**

An ISA must involve at least one research group from a SystemsX.ch partner institution. It may, however, involve a rotation between various labs already collaborating on a Systems Biology project to give the industrial scientist a wider range of understanding of the aims of a SystemsX.ch project(s). The sabbatical should be prepared and structured to maximize mutual benefits. The goals of the sabbatical can be either to work on specific scientific questions or to allow the sabbatical scientist from industry to be introduced and/or trained on particular methods/ technologies. Addressed goals must be relevant to Systems Biology.

The industrial scientists' salary is paid by her/his company for the duration of the sabbatical. The academic research group can make contributions in terms of disposables and lab equipment needed by the scientists during his/ her stay. To reach particular goals during the sabbatical, the academic partner may apply for up to 50% funding from SystemsX.ch for consumables etc (**no salary costs**). The planning of the sabbaticals must be jointly elaborated and submitted. Details concerning intellectual property rights should be addressed prior to submission between the academic and industrial partners.

The submitted proposals can be submitted any time via the management office and will be reviewed by the SystemsX.ch Scientific Executive Board. The SEB will decide which proposals are accepted, and how much funding shall be granted. SystemsX.ch funds can not flow to the industrial partner.

The ISA proposal must include a goals, milestones and timelines. If your project has special funding needs, please contact the Management Office.

### 3.3.4 Submission Deadlines

Deadlines are February 1; May 1; August 1; and November 1 of each year. The first deadline will be **November 1, 2009**. The final deadline in this first round of SystemsX.ch calls will be November 1, 2011.

## 4 Appendix: Abbreviations

BIP	Bridge to Industry Projects
BoD	Board of Directors (all Presidents and rectors of SystemsX.ch partner institutions)
SEB	Scientific Executive Board (Scientists of different Systems Biology fields & partner institutions)
ISA	Industrial Sabbaticals in Academia
MO	SystemsX.ch Management Office
IPP	Interdisciplinary (high risk) Pilot Project
IPhD	Interdisciplinary PhD Project
SNSF	Swiss National Science Foundation
SER	State Secretary for Education and Research
SUK/CUS	Swiss University Conference