

X-Letter

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LEADERSHIP CHANGE

Ruedi Aebersold hands over the SEB chairmanship to Lucas Pelkmans

“INFECTX”

Researchers on the trail of new therapies for infections

7th ANNOUNCEMENT

Wanted: New projects for graduate students and postdoctoral fellows

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Start of the **second phase:** SystemsX.ch **supports 15 new projects**

Of the 40 research proposals submitted following the 6th call for proposals, the Swiss National Science Foundation (SNSF) approved eleven “Research, Technology and Development Projects” (RTD) and four “Transfer Projects” at the end of last year. The 15 selected projects will be funded to a total of CHF 29.2 million, which means that SystemsX.ch’s consolidation phase (2013–2016) can commence.

Daniel Vonder Mühl

Many requests for RTDs and Transfer Projects were submitted following the 6th call for proposals (closing date was the end of August 2012). The tender was open to new projects but existing RTDs were also able to compete with a follow-up project.

With the first ever Transfer Projects SystemsX.ch sought to encourage partnerships between at least one each of an academic and a private research group, in order

to promote cooperation between universities and spin-offs, SMEs or private industry.

Over 200 research groups competed

By the expiry of the submission deadline, 40 applications had been sent in: 33 for RTDs and seven for Transfer Projects. Overall, 200 research groups were involved in the project applications. In addition to a number of researchers from SystemsX.ch partner institutions, 14 research groups from industry or

“I am happy to hand over a flourishing program”

Prof. Ruedi Aebersold, Institute of Molecular Systems Biology, ETH Zurich



In the early 2000s, systems biology emerged as a widely discussed but imperfectly defined approach to the analysis of complex biological systems. With great foresight, the rectors of the Universities of Basel and Zurich and the President of ETH Zurich – remarkably all non-biologists – decided to establish a joint program in systems biology and to give it financial support of CHF 10 million. In 2004, arriving at ETH and the UZH from the pioneering Institute for Systems Biology in Seattle, I was offered the exciting opportunity of helping to establish this program, then termed SystemsX. In 2006, Charles Kleiber, then State Secretary for Education and Research, paved the way to extend SystemsX into a Swiss-wide initiative, and SystemsX.ch was born. As the chairman of the Scientific Executive



Eleven RTD Projects and four Transfer Projects start this year. Photo: Christian Flierl

Table 1: Eight new RTDs and three follow-up RTD Projects were successful and will be financed to a total of approx. CHF 28 million.

RTD Projects approved in 2012	Principal Investigator	Involved Institutions	Number of Research Groups
Phosphonet personalized precision medicine	Aebersold, Rudolf	ETHZ, UZH, SG*, TU Dresden	8
TubeX: Multiscale network control of micro-tubule organization and dynamics	Barral, Yves	ETHZ, PSI	4
Inference of local regulatory networks employing genetic and cellular variation in human cells	Dermitzakis, Emmanouil	UniGE, EPFL, UniL, MIT	6
MecanX: Physics-based models of growing plant cells using multi-scale sensor feedback	Grossniklaus, Ueli	UZH, ETHZ, IBM, TemtoTools	6
PlantMechanix: Understanding how plant organs attain their specific 3-dimensional shapes	Kuhlemeier, Cris	UniBE, UniL, UniFR, ETHZ	9
Center for systems biology of epithelial mechanics (MechanX): modeling physical and biological processes generating organs shape and size in development	Milinkovitch, Michel	UniGE, UZH	5
AntibodyX: Quantitative molecular analysis of antibody repertoires that develop in response to vaccination and pathogenic infection	Reddy, Sai	ETHZ, UZH	5
SynaptiX – The systems biology of forgetting	Sprecher, Simon	UniFR, UniBE, U Nevada	5
Systems biology of forebrain development	Taylor, Verdon	UniBas, ETHZ	6
LipidX – Systems Biology of Biomembranes	van der Goot, Gisou	EPFL, UZH, UniGE	5
Dealing with uncertainty: controlling and exploiting stochasticity in gene regulatory networks	Zavolan, Mihaela	UniBas, EPFL, UniL	6

*) Cantons Hospital St. Gallen

SMEs also applied, as well as six research groups from universities abroad. While the latter are eligible for participation in a project partnership, SystemsX.ch funds can only be granted to public research groups at Swiss institutions.

Clearly defined project requirements

Among the applicants there were seven partnerships that have amassed a lot of practical experience in systems biology research since 2008 in their RTD Projects. However, these could not, a priori, expect to be approved as follow-up projects. The call clearly stated that all new projects must increasingly integrate quantitative biology and the corresponding theory and model development. At the same time the condition of incorporating new research groups in the projects had to be met. The requirements therefore were demanding – for both new projects and existing partnerships.



The eleven approved RTDs

These requirements were met in eleven of the submitted RTD Projects. Taken together, the approved projects cover a wide range of topics; from classical cell biology, development biology, botany, biochemistry, genetics, biophysics, to cancer. Each project includes a substantial level of the development of appropriate models. Table 1 shows the eleven funded RTD Projects that will start in the first half of 2013.

The project managers of approved RTDs are spread across six locations and seven partner institutions: ETH Zurich (3), the University of Basel (2), the University of Geneva (2), and one project each from EPFL, the University of Bern, the University of Freiburg and the University of Zurich. Ten of SystemsX.ch's 12 partner institutions are represented in the newly approved projects.

Three successful re-applicants are also to be found on the list of funded RTDs:

Board (SEB) I had the privilege of working with a group of committed colleagues and, with the support of the leaders of the 12 SystemsX.ch partner institutions, of building SystemsX.ch into a unique program. I am proud that over a thousand scientists, at all levels of their careers, have chosen to join in the endeavor.

In January 2013, we entered the second and final phase of SystemsX.ch. I am happy to hand over a flourishing program to Lucas Pelkmans, the new chair of the SEB. I wish him every success and satisfaction in the new position. I also thank those leaders who made SystemsX.ch possible and the numerous colleagues who support it. Generations of scientists will benefit from their foresight.

An interview with Ruedi Aebersold can be found on page 4.

Ruedi Aebersold, Cris Kuhlemeier and Gisou van der Goot. The latter two have reduced the wide partnership of the first phase and will be continuing their projects, “Plant Growth in a Changing Environment” and “LipidX” (Kuhlemeier and van der Goot, respectively), for the next four years. Aebersold will be focusing on the follow-up project to PhosphonetX with “Personalized medicine-precision”, which, like van der Goot and Kuhlemeier, draws in largely new research groups.

Four new Transfer Projects

According to the statement from the SNSF Review Panel, the seven research proposals submitted for Transfer Projects can be divided into two groups. In the approved four requests the review panel is convinced that a close partnership will ensue on an equal footing. In the three unsuccessful requests the panel perceived an imbalance between the two applicants and deemed it likely that the university would be providing a service for the industrial partner.

Table 2: Four Transfer Projects that can start in 2013 with a total investment of more than CHF 1 million.

Transfer Projects approved in 2012	Applicants	Cooperation between
EvolutionX: Analysing Evolution of Resistance to a Novel Siderophore Antibiotic in Gram-negative Bacteria by Next Generation Sequencing	Creus, Marc	UniBas and Basilea
In vivo endoscopic fluorescence imaging in the dopamine system of the healthy and diseased brain	Helmchen, Fritjof	UZH and Roche
Statistical Reverse Engineering of the Signaling Network involved in Cachexia	Koepl, Heinz	ETHZ and Novartis
Multi-modal assessment of mutated predictors BRAF and DDR2 at lung carcinoma invasion fronts by topographic DNA extraction and micro-immunohistochemistry using the microfluidic probe	Soltermann, Alex	UZH and IBM

The SNSF Review Panel pointed out that it was difficult and costly to develop a balanced application. This is a charge that Novartis and Roche, as well as Basilea and IBM, executed successfully (see Table 2).

Wide geographic distribution

A glance at the 15 projects that will be supported engender great expectations

for the coming four years. Together with the increased integration of theory and modeling, and the focus on medically/clinically relevant topics, a geographical opening of several SystemsX.ch partners is also achieved. In addition, many new research groups are involved in the funded projects, which will help to be a long-term anchor in Swiss systems biology research.

International Conference on the Systems Biology of Human Disease – SBHD 2013

A highlight of the event calendar 2013 is the SBHD conference, which takes place, June 12–14, at the German Cancer Research Center (DKFZ) in Heidelberg. The international SBHD conference series was launched some years

ago by Professor Peter Sorger and colleagues at Harvard Medical School in Boston and offers an annual platform for scientific exchange between European and American systems biologists. The conference deals with systems

biological research to develop new diagnostic and therapeutic approaches for the most common diseases in humans. The Helmholtz Alliance on Systems Biology, the BioQuant Center, the University of Heidelberg and SystemsX.ch have co-organized the conference in recent years. The conference venue alternates between the continents and will be in Heidelberg again in 2013. The program provides an annual mix of well-known American and European speakers and selected short oral and poster presentations of young scientists.

More details about the speakers and additional information at: www.sbhd2013.org.

sel

SystemsX.ch has a limited number of free registrations for this meeting for its researchers. If you're interested or have any questions, please contact: jens.selige@systemsx.ch.



Leadership change at SystemsX.ch

After more than five years as Chairman of the Scientific Executive Board (SEB), Ruedi Aebersold has stepped down. His successor is Lucas Pelkmans. Aebersold sees the start of the second and final phase of SystemsX.ch as the ideal time for a handover. The renowned researcher has consciously made the decision to hand over the reins to new forces to make room for the further development of systems biology research.

Interview Christa Smith

How did you experience the first phase of SystemsX.ch?

As a success and an extremely interesting challenge. We had the opportunity to build a nation-wide research initiative that supports a wide range of themes – this was a first for Switzerland. While the National Centres of Competence in Research (NCCR) of the Swiss National Science Foundation focus on a specific topic, such as structural biology, genetics or neurobiology, at SystemsX.ch we aren't investigating any particular biological question, but the way in which biological processes are examined as integrated processes and how they work together or are related. We also wanted to ensure that the Swiss researchers who work on systems biology network with each other.

Where are we in the process now?

In order to make SystemsX.ch work, we first had to build the necessary infrastructure. SystemsX.ch has the legal status of a simple partnership. As members, the partner institutions are committed to contributing their own funds. This led to issues about how the initiative deals, for example, with intellectual property rights or “matching funds”. The appropriate legal arrangements and the necessary organizational structures are in place. The lessons that have been learned and the experience gained can be helpful in future for the implementation of similar scientific initiatives.

How well anchored is systems biology now?

The initiative appealed to many researchers in Switzerland. So far, more than 1000 scientists have been involved in SystemsX.ch projects. We can assume that a large proportion will continue to work on systems biology subjects even after SystemsX.ch comes to an end.

Systems biology requires close collaboration between scientists. How has the networking evolved?



Ruedi Aebersold contributed significantly to the successful creation of SystemsX.ch. Photo: msc

Applying network analysis, we have shown that earlier researchers mainly collaborated with other scientists who have similar specializations and, geographically, come from nearby institutions. With SystemsX.ch this networking has expanded. Within the initiative, more researchers from different disciplines and interests work more closely together nowadays – and not only nationally but internationally. This development has been driven, mainly by the fact that geographically and thematically separated scientists have come together to work on common projects.

The first phase of funding SystemsX.ch ended in 2012. What comes next?

The various bodies involved, including the Swiss National Science Foundation, the State Department, the Swiss University Conference and the ETH Board, have approved the second phase (2013–2016).

This decision and the financing was approved by Parliament late 2012.

Will this second phase be followed by a third?

No, it was not planned that the initiative would be renewed every four years. The second phase will see the completion of SystemsX.ch. At most, there will be a short phase-out period. By then, the established structures should enable researchers that work on systems biological approaches to integrate them into their own research projects.

Will the focus of the projects shift during the second phase?

We have studied the project portfolio in detail and defined two priorities for the next four years. The first is medically oriented research and the second, collaboration with industry. In these two important areas, projects have had only modest success so far overall, so these

two areas will be given priority in the second half. This doesn't mean, though, that promising projects with a different focus won't be supported. The quality of a project is still the most important consideration, and, of course, the biological systems approach.

You and your team have successfully applied for a new project. What is the work about?

We want to combine protein measurement with genomic evolution. On the one hand, each person's genome differs from that of any other individual in a population. On the other, the genome of a diseased cell is different from that of a healthy cell in the same person. Nobody knows in detail how the altered genetic information is translated into molecular processes that lead to diseases like cancer. We are trying to determine this by measuring protein.

That sounds very ambitious – is a Nobel Prize on the cards?

(smiles) I don't know – and I don't much care! We're trying to advance the research. What comes out in terms of a Nobel Prize or any other award is secondary. The same applies to patents.

Even if we focus on results that might be eligible for medical application, that doesn't automatically lead to product developments.

To return to your resignation as Chairman. Will you withdraw entirely from operational management?

I've given this a lot of thought. However, I would like to continue to be involved in the Scientific Executive Board, but as a regular member of the committee.

How easy – or difficult – is it for you to hand over control?

SystemsX.ch is on track, I'm pleased to hand over the wheel. The Chairman of SEB influences the development of SystemsX.ch to a relatively strong degree. Over time, it wouldn't be good if this office was always held by the same person. Other opinions and views will enrich the initiative. And now is the ideal time to make this change. The initiative is assured for the next four years and I know that the operational management is in good hands. I'm convinced that SystemsX.ch will continue to develop positively.



The new Chairman of the SEB

Lucas Pelkmans studied Medical Biology at the University of Utrecht (Netherlands), and obtained his PhD in Biochemistry from ETH Zurich in 2002. He was a postdoctoral fellow at the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden. In 2005, he accepted an assistant professorship at the Institute of Molecular Systems Biology at ETH Zurich. In 2010, he became full professor and was called to the Ernst Hadorn Chair at the University of Zurich.

In June 2012, the Board of Directors of SystemsX.ch elected Prof. Dr. Lucas Pelkmans as new chairman of the Scientific Executive Board (SEB).

With patience, foresight and determination: Ruedi Aebersold made the Swiss research initiative, SystemsX.ch, to what it is today. Over the past six years he has been responsible for the shaping of SystemsX.ch to an exceptional degree. His engaging personality and way of dealing with the various forces in and around SystemsX.ch were the main success factors in all this.

Daniel Vonder Mühl
When, in 1999, Lee Roy Hood, Alan Aderem and Ruedi Aebersold, established the world's first Institute for Systems Biology (ISB) in Seattle, the human genome had not yet been deciphered. Five years later, Aebersold was called to a Chair at ETH Zurich and returned to Switzerland after almost 30 years. In the meantime he had become one of the key figures in systems biology.

Strong leadership and diplomacy

In the heady, sometimes stormy, early days, when it was necessary to set right the sails and circumnavigate the first cliffs, Aebersold's calm and dedicated manner was steadfast. In the Scientific

Executive Board's sometimes turbulent meetings, he always found a way to calm the waters and reach a consensus. His unwavering patience in such situations was firmly based on the conviction that, ultimately, the best argument prevailed.

A lot of personal effort

Aebersold's leadership and role as Chairman of the Scientific Executive Board raised the credibility of SystemsX.ch in no uncertain way, especially within the international research community. This also helped to open doors.

During his tenure as chairman Aebersold invested a lot of time moving the initiative forward. This entailed countless meetings and discussions on

the operational, political and scientific level and expounding the ideas of the research initiative to representatives from industry and politics.

Now that nothing more stands in the way of the second phase (2013–2016), Aebersold has decided to hand over the chairmanship SystemsX.ch to Lucas Pelkmans. In future, Aebersold will turn his attention to his own research and projects, which often had to take a backseat in the past six years while he focused on SystemsX.ch.

SystemsX.ch thanks Ruedi Aebersold for his commitment and wishes him continuing success and all the best for the future.

The **development of resistance** to infectious pathogens poses an increasing **threat to our health**. But researchers from **InfectX** are on the right track to new therapeutic approaches.

Matthias Scholer

“There probably isn’t a single ‘magic bullet’ that can solve the problem”, surmises Professor Christoph Dehio. The microbiologist describes the best possible outcome of his research in precise phrases. “To find a therapeutic approach, which can contend with all bacteria and viruses. And without the development of resistance and side effects for the patient.” It is unlikely a panacea will be found to combat all pathogens, but innovations to fight infectious diseases are urgently needed. “Because of increasing resistance, incidence of bacterial and virally caused diseases is rising significantly”, says Dehio.

According to latest WHO estimates around 25 000 people die in Europe every year from infections that are caused by bacteria that can no longer be fought with the present range of approved antibiotics.

Fundamentally new strategies

Until now anti-infectives have worked by doing direct damage to the pathogen.

To affect the host organism as little as possible, the targets of these drugs are only found in the pathogen. Penicillin, for example, targets only the unique cell walls of the bacteria, while other antibiotics block specific enzymes of the bacterial metabolism that do not occur in humans.

The disadvantage of this treatment approach is that, due to genetic mutations that change the corresponding structures, pathogens can emerge that are protected against the applied drug. Owing to the variety and variability of pathogens development of resistance to a new drug can follow close on the heels of its introduction.

“We need fundamentally new strategies to fight infectious diseases”, stresses Dehio. This is why the main goal of the RTD “InfectX” project, which he has directed for the past three years, is to find innovative approaches. The team’s focus is on so-called “intracellular pathogens”. These comprise all viruses, but also bacteria, that are dependent on the structures and mechanisms of the infected host cells for their intracellu-

lar growth and can even tap into their host’s metabolism for their food and energy supplies. “We are interested in what is happening at the molecular level between these pathogens and the infected host cells”, explains Dehio.

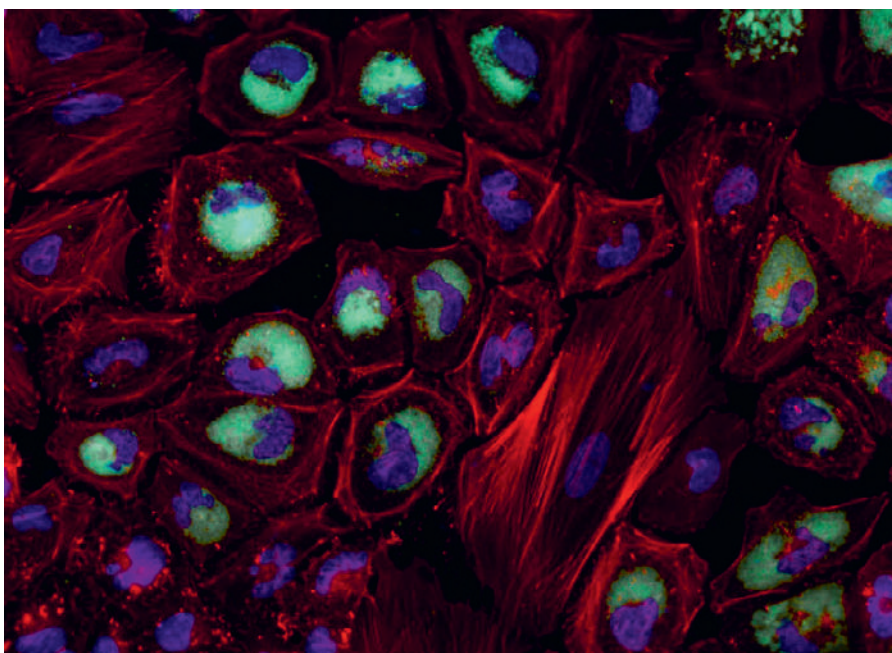
Restricting the host’s capacity to assist infection

InfectX is investigating the infective development of five bacteria and four types of viruses. “The behavior of these nine pathogens is representative of the majority of intracellular pathogens. Basically, each of them makes use of a certain part of the host cell’s basic machinery, regardless of the clinical picture it causes or the tissues it attacks”, says the researcher. The team not only wants to investigate the infection of individual pathogenic agents, but also develop a broad-based model which will allow them to carry out computer simulations of the infection mechanisms of as many intracellular pathogens as possible. “This would then allow us to identify similarities between the pathogens and thus to define potential targets for therapeutics”, is how Dehio summarizes the concept.

The spread of infection is limited by a restriction of the host’s functions essential to permit infection. Therein lies the big difference compared to conventional drug treatment strategies. This disruptive intervention can happen, for example, at the start of infection, when the pathogen enters a cell, during the transport through the cell, or by means of multiplication with the help of the cell’s own structures. The advantage of this approach is that the pathogen is unable to develop resistance.

Complex investigation

However, owing to the sheer variety of molecular interactions between invader and host cell, what sounds simple is, in practice, an extremely complex task. This is why InfectX’s research teams are investing so much time in the development of appropriate methods and pro-



Human cell after infection with the bacteria *Brucella abortus* (blue: nucleus, red: cytoskeleton, green: intracellular pathogens). Photo: InfectX

protocols. As parallel research is being carried out at multiple institutes, including the universities of Basel and Zurich as well as the ETH Zurich, the groups must also pay due regard to strict standardization. "Both the methodology used in the experiments as well as the computerized calculations had to be defined in detail. This is the only way to develop a comprehensive model applicable to all agents."

Identifying essential factors

The research activities are in full swing. The scientists are currently looking into the entire human genome to identify essential factors for occurrences of infection.

Here, special cell culture plates with arrays of small wells come into play. At the beginning of an experiment, all these wells are supplied with human cells. With the aid of the "RNA interference" method, one of the approximately 20 000 known human genes is inactivated in each of the individual wells. Subsequently, a bacteria or virus of a given species is added to all wells. "In each of these wells the infection process can run its course under standardized conditions. If the multiplication of intracellular pathogens in a particular well runs faster, slower or even comes to a complete standstill, we can draw conclusions about the role of the inactivated gene or its product in that particular well", explains the microbiologist.

In order to quantify the spread of the pathogen, activities in each compartment are recorded pictorially. "We use infectious agents that, due to a genetic trick, produce a fluorescent protein. This allows us to track the route of infection and the multiplication rate of the pathogen", explains Dehio.

Basic research, modeling and future visions

What the scientists capture is very important basic data, such as the condition of the cytoskeleton, the size of the nucleus, and about 250 other measurements. "So far, only about one third of the human genome has been allocated to a known function. Our data should help to close this gap", says Dehio.

This combination of basic biomedical research, the modeling of complex relationships and the development of innovative therapies also neatly represents the field of systems biol-



The team also includes computer science specialists, who, together with SyBIT, are developing specialized software for the analysis of millions of microscopic images (left to right, Mario Emmenlauer, Christoph Dehio and Pauli Rämö). *Photo: msc*

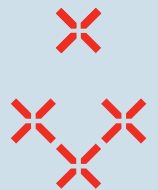
ogy research in an exemplary way. "The cooperation between different specialists and institutions is what makes it possible to cover such a wide area, as well as finding new ideas that interest industry."

This means that we also have good reason to hope that in a few years time, our lives will no longer be threatened by resistant pathogens.

The InfectX-team

InfectX comprises a consortium of eleven research groups, ten of which work in Switzerland.

- **Prof. Christoph Dehio**, Biozentrum, University of Basel (coordination), bacterial infection (brucellosis and bartonellosis)
- **Prof. Cécile Arrieumerlou**, Biozentrum, University of Basel bacterial infections (shigellosis)
- **Prof. Niko Beerenwinkel**, ETH Zurich, Basel, modeling
- **Prof. Peter Bühlmann**, ETH Zurich, modeling
- **Prof. Pascale Cossart**, Pasteur Institute, Paris, bacterial infections (listeriosis)
- **Prof. Urs Greber**, University of Zurich, viral infections (adenovirus, rhinovirus)
- **Prof. Wolf-Dietrich Hardt**, ETH Zurich, bacterial infections (salmonellosis)
- **Prof. Ari Helenius**, ETH Zurich, viral infections (vaccinia)
- **Prof. Pelkmans**, University of Zurich, viral infections (rotavirus)
- **Prof. Christian von Mering**, University of Zurich, modeling
- **Prof. Bernd Wollscheid**, ETH Zurich, proteomics



InfectX
Systems Biology
of Pathogen
Entry into Human Cells

InfectX Overview

Project Director: Prof. Christoph Dehio (Biozentrum, University of Basel)

Number of research groups: 11

Researchers/Administration ratio: 56:2

Biologists/non-biologists ratio: 40:18 (incl. administration)

Total budget (2010–2013): CHF 10.3 million, of which CHF 5.1 million from SystemsX.ch

Targeted **youth development**. The **7th SystemsX.ch Call** is looking for new **graduate student** and **postdoc projects**.

Jens Selige
With the seventh call, launched in December 2012, SystemsX.ch specifically wants to promote young scientists and scholars. Applications for “Transitional Postdoc Fellowships” (TPdF) and “Interdisciplinary PhD Projects” (IPhD) should be submitted by April 15, 2013.

Interdisciplinary PhD Projects

To train and nurture the next generation of systems biologists SystemsX.ch annually funds new interdisciplinary doctoral theses. The focus of these so-called IPhDs is the interdisciplinary collaboration of systems biologically relevant disciplines, such as biology, computer science, medicine, mathematics, engineering, physics or chemistry.

Applicants for these interdisciplinary doctoral theses projects are not the students themselves but the corresponding group leader. Along with a co-applicant in another field he or she takes over and supervises the doctorate. Both co-applicants work at a SystemsX.ch partner institute.

SystemsX.ch covers the salary costs of the graduate student for three years, with the possibility of an additional year's extension. The cost of consumables up to max. CHF 10 000 p.a. and costs for one international conference per graduate are also covered by SystemsX.ch.

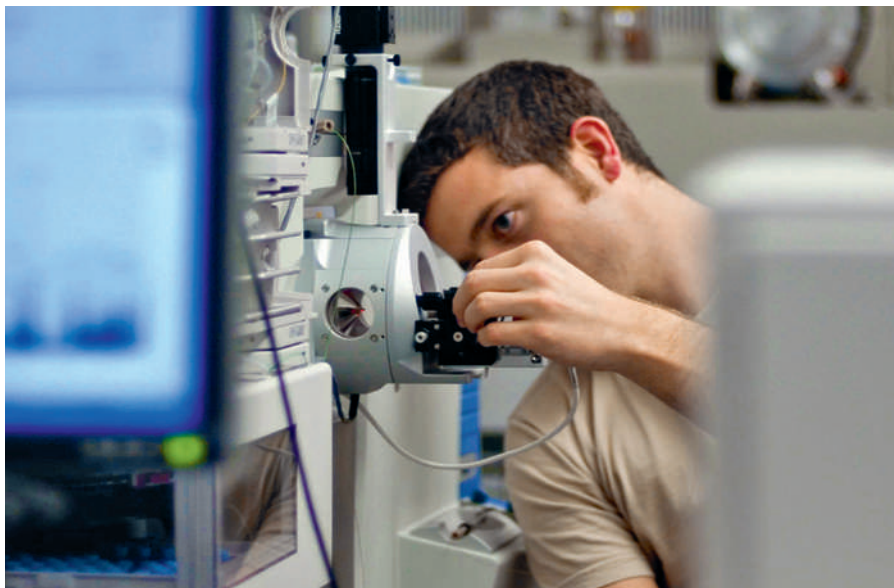
Transitional Postdoc Fellowships

This is the second SystemsX.ch call for TPdFs. In this project type ambitious young researchers formulate their own interdisciplinary project application. “Transitional” in this context means that a candidate switches from his or her original discipline to a new, complementary field. For this they must look for a research group where they can incorporate and carry out their own project while working their way into a new discipline. In this way SystemsX.ch not only promotes the transfer of knowledge, but also the interdisciplinary collaboration that systems biology research cannot do without.

Initially the duration of a TPdF is limited to two years. However, there is

an option of renewal for a third year. SystemsX.ch covers salary costs and the cost of supplies up to CHF 10 000 francs annually.

dent scientists from Switzerland and other European countries and is being used for the first time in the seventh tender. Thematically, the panel covers



Targeting the development of young scientists, also in 2013. Photo: Christian Flierl

Following stipulations apply to a TPdF:

- a substantial part of the interdisciplinary research must include quantitative measurements and/or the development of models for the simulation of biological processes;
- candidates must be prepared to work their way into a new, systems biologically relevant discipline;
- candidates must find a research group to accept them and where they have not worked for longer than six months;
- successful graduates have visiting fellow rights in the research group of a SystemsX.ch partner institution and may share the infrastructure and other facilities.

New Expert Panel

Together with the Swiss National Science Foundation (SNSF), SystemsX.ch is appointing a new body to select appropriate projects and candidates for TPdFs and IPhD Projects. The new expert group consists of ten indepen-

the entire spectrum of systems-biology-related questions. One representative each from the SNSF and SystemsX.ch's Scientific Executive Board (SEB) will serve the group in an advisory capacity. Another innovation has been introduced in the application process for TPdFs. Until now applicants were invited for an interview. For organizational reasons, interviews will be omitted in future.

The selection criteria for TPdFs and IPhD Projects are similar and can be summarized as follows:

- Focus on clearly defined biological systems and issues
- Interdisciplinarity, quantitative approach including modeling
- Novelty and usefulness for systems biology
- Structure and feasibility of the project
- Academic reputation of the candidate and the host research group

Further details on the 7th Call can be found at: www.systemsx.ch.

PhD Retreat 2012: “A mixture of **learning, therapy, bonding** spiced up with a very efficient **science exchange**”

This year's SystemsX.ch PhD student retreat ushered in a change of format. For the first time, the classic elements of a retreat, such as scientific and personal exchanges, were combined with topics of particular relevance to graduate students. This year the focus was on the soft skills required for a successful presentation of a project. Two PhD students, Alina Isakova (EPFL) and Artur Yakimovich (UZH), told us what they thought about the changed format and what benefits they had gained from the coaching.

Interview Christa Smith

What were your reasons for taking part in the retreat?

Alina: The format of the event. I have never participated student retreats before and was curious about it. Besides, the topic of the retreat “Human Factor” caught my interest.

Artur: I have recently started an Interdisciplinary PhD Project (IPhD). The regulations recommend participation and this was my first reason. But I have to admit that the lineup of this year's program made me very curious, and I looked forward to going.

Why are skills like communication important in research?

Alina: Communication is one of the essential skills of a modern scientist. Nowadays it's not enough to do good research. It is also important to be able to communicate it to others. Sadly, though, most graduate students are never taught the basic concepts of successful communication. And as it became obvious during the retreat that nearly all of us struggled and clearly lacked the necessary presentation skills.



Alina Isakova (EPFL)



Artur Yakimovich (UZH)

Artur, you've taken part in other retreats. How did this event differ from the others?

Artur: It was an entirely different experience. Starting with the fact that we were not allowed to prepare anything in advance. The event didn't even kick off with science, which was already astonishing – we started by getting to know one another. With the help of the two coaches we built up a kind of a “circle of trust”, where everyone learned to accept and respect each other – all that even before starting with science! It created an amazing atmosphere for the whole retreat.

What concepts and skills did you bring away from the retreat that you can apply immediately to your working environment?

Alina: I really liked the concept of “OKness” which was conveyed to us when we were dealing with the basic skills of communication. “OKness” is a very deep notion that comes down to being “OK” with the person (or audience) you're talking to as well as being “OK” with yourself. I guess one can say

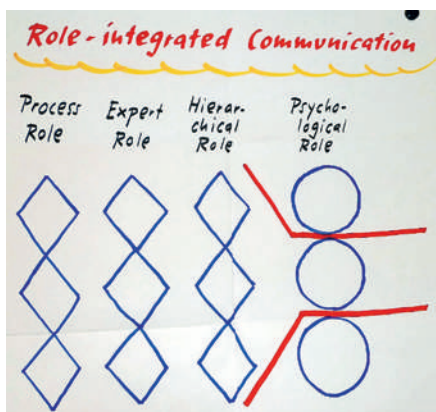
that “OKness” comes along with respect. We also learned other useful skills on giving a good presentation. And then we were immediately able to apply what we'd learned by presenting our own research to the meeting.

Artur: For me it was giving scientific talks – already on Monday I was using my new skills, while coaching the students I was supervising to give their final presentation. And that's just the start.

What were the highlights of the retreat?

Alina: I would highlight the competence of our coaches Sašo and Hilde, the content of the workshop and the way they communicated that to us was fantastic. We were introduced to many interesting concepts and presenter skills in a sensitive but detailed manner.

Artur: It's not that easy to pick out a highlight from such a mixture of different experiences. For me it was the mixture itself – of learning, therapy, bonding, spiced up with a very efficient science exchange. Personally, I found the level of bonding quite impressive. I knew



No communication, no transfer of knowledge.

Photo: Sašo Kočevar



The 17 participants of the retreat learning what makes a successful presentation. *Photo: Jens Selige*

only few people there, by the end of the retreat I think I could say I know everyone very well.

In addition to the scientific and coaching program the event was reinforced by social activities. What can you tell us about them?

Alina: The hiking trip to the glacier organized in the frame of the retreat was amazing!

Artur: For me the high rope course had quite some impressive moments, which challenged my fear of heights ...

Will you attend the next year's SystemsX.ch student retreat if possible?

Alina: No doubt about it! The student retreat is a unique opportunity to inter-

act with my colleagues, PhD students, in an informal environment. At the retreats – in contrast to conferences – we were able to talk, not only about science, but also how we do science, which is another exciting aspect of it, I think.

Artur: Absolutely. I think it was a brilliant crowd. I met a lot of great people and learned a lot. We had fun and stayed amazingly productive – this is just what I love.

The PhD Student Retreat 2012 at a glance

The three-day training event took place this year at the beginning of October in Engelberg. Guest speakers were the two renowned coaches, Sašo Kočevar and Hilde Janssens. The two communicators shared their expertise on management skills in a course tailored specifically to researchers at all levels.

More information about SystemsX.ch student retreats can be found at: www.systemsx.ch > Events > Educational Events.

LS² Annual Meeting: January 31 and February 1, 2013



Life Sciences Switzerland (LS²) is the new name for USGEB (the Union of Swiss Societies for Experimental Biology). A number of various Swiss societies, active in the fields of molecular, cellular and experimental biology, merged to form this union in 1969 in order to boost aca-

demix exchanges and promote young researchers in Swiss academic institutions.

Systems biology has played an increasingly important role over the past 10 years in the field of life sciences research. This development is also reflected in the title and program of the LS² annual conference, “(R)evolutions in Biology”. In parallel proceedings, the two-day event covers (r)evolutionary developments in the life sciences. SystemsX.ch will also be present at the meeting. In the parallel systems biology proceedings, both project leaders and PhD students will be presenting their

projects. Other central themes include biochemistry, imaging, laboratory animals, pharmacology, physiology, genetics and parasitology.

New approaches in the field of systems biology and immunology in embryonic development are the focus of the keynote papers. In addition, the interplay of mathematical theories and experimental biology will be a salient topic.

Registration and more information about this annual conference are available at: www.ls2-annual-meeting.ch.

sel

SystemsX.ch is a partner in the new European network “ERASysAPP”

Jens Selige

In October 2012, the European Commission approved an ERA-NET (European Research Area-Network) for systems biology, with a maturity of three years. The name of the new network is “ERA-SysAPP” (ERA Systems Biology Applications). This European consortium will strengthen the Europe-wide networking and implementation of the individual, national research activities in the field of systems biology.

As a Swiss partner, SystemsX.ch is part of this network. The program has started on January 1, 2013, and will be coordinated by the Research Centre Jülich (Germany).

Main objectives and tasks

The consortium comprises 16 partners from 12 European countries. The transnational funding organization is divided into six working areas, called Work Packages (WP). One partner is responsible for each WP. Together with other interested partners in the consortium the responsible partner implements the relevant tasks. The main objectives and tasks of this innovative transaction can be summarized as follows:

- The establishment, support and maintenance of systems biology research structures in a larger number of countries in the ERA than in the past to help execute the ongoing and proclaimed paradigm shift towards systems biology in the life sciences (all WPs).
- Setting up joint transnational calls with a focus on transnational systems biology and application to tackle those questions on complex biological processes in microorganisms, plants and animals, which are of current and broad interest in the life sciences (WP2 and WP5).
- The organization and execution of transnational systems biology networks in the ERA (WP3, WP5, WP6). Whenever possible, networks from outside the ERA shall be approached and integrated to convert ERA networks to global systems biology networks.
- Execution and organization of optimized educational and training measures for scientists, graduate students and systems biology students in the ERA (WP3, WP4 and WP6), including a scientific exchange program.
- The support and adaptation of data management systems, data management standards and “good practices” for data sharing in the ERA (WP4).
- The exploration and support of mechanisms to strengthen ERA’s academic-industrial systems biology links (WP5 and WP6).
- Stringent and transparent coordination, organization and support of ERASysAPP according to ERA-NET rules and the establishment of a lively, active and fruitful communication among the consortium partners (WP1).

Active role for SystemsX.ch

SystemsX.ch will be responsible for the work package WP3, “training and exchange”. One of its first tasks in this area includes the compilation of information on the various European graduate programs, courses and conferences in the field of systems biology. This overview will then be published on the website at ERASysAPP. Lists of web-based and e-learning programs and lectures round out this facility.

Furthermore, in future, SystemsX.ch will organize its summer schools together with the pertinent network partners. Corresponding preparations for a joint “Summer School” in Barcelona in June 2013 are already underway.

SystemsX.ch is also working with the WP2, WP4 and WP5 packages and will thus be able to participate in the planning of transnational project tenders. The exchange of experience in data management and communication complements this area of cooperation.

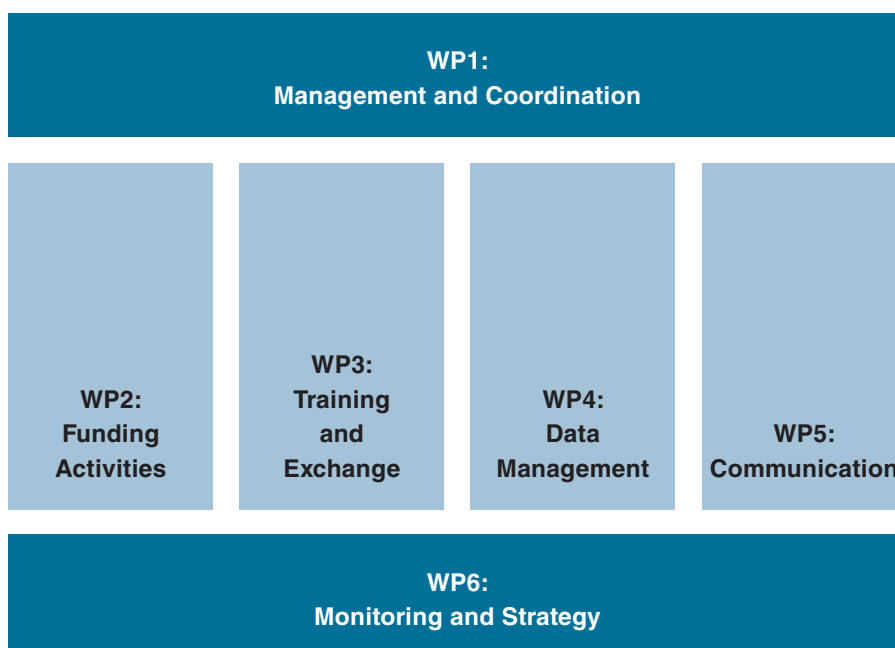


Figure 1 shows the thematic areas of actively cooperative work packages (WP) set up at ERASysAPP.

Systems Biology of Infection Symposium – June 23 to 27, 2013, in Ascona

This international conference will focus on concepts and methodologies in systems biology of infection, offering the unique opportunity for researchers at all levels to discuss the latest topics in this rapidly emerging field. The coordinators are the principle investigators of “InfectX” and “BattleX”, Prof. Christoph Dehio and Prof. Dirk Bumann (Biozentrum, University of Basel).

The conference will be held at the spectacularly located Centro Stefano Franscini conference centre (CSF) at Monte Verità, overlooking Lake Maggiore in Ticino, Switzerland. The program includes invited speakers who are leaders in the field, as well as selected

short talks and posters from participants.

CSF poster prize

Young researchers, especially PhD students and postdocs, are encouraged to submit an abstract for a poster to be presented at the Symposium. From the poster abstracts submitted, the authors of the most interesting and scientifically relevant abstracts will also be invited to present a short talk.

CSF offers a prize for the best poster. All posters presented at the Systems Biology of Infection Symposium will be eligible for consideration for the CSF poster prize, provided the presenting author is not older than 33 years

and is either a PhD student or a post-doctoral researcher within 3 years of the end of their PhD.

Source: www.infectx.ch/SysBioInf



In June, the system biologists will meet at the Monte Verità. Photo: © Ticino Turismo

SystemsX.ch is funding two SIB PhD Fellowships



Swiss Institute of Bioinformatics

Research in life sciences, especially systems biology, generates gargantuan amounts of data. It has been estimated that between 2011 and 2020, these disciplines will produce data at a rate of up to a million times higher than today. In order to analyze, visualize and

interpret such data, there is a fast-growing demand for specialized, well-trained bioinformaticians. To help create this pool of excellency, and to promote bioinformatics research for the life sciences, the Swiss Institute of Bioinformatics (SIB) launches its PhD Fellowship program, starting in 2013.

SystemsX.ch will support this approach by funding 2 Fellowships. Laureates of the SIB Fellowship program will receive a financial grant for 3 years that is extensible for 1 year. They will carry on their research projects under the supervision of a SIB group leader and

will be registered at the respective University in Switzerland.

Swiss Institute of Bioinformatics (SIB)

The SIB – a partner institution of SystemsX.ch – is an independent non-profit foundation recognized as a public utility. Its 31 research and service groups develop, maintain and provide core bioinformatics resources that are highly appreciated by the worldwide life sciences community.

Source: www.isb-sib.ch

Welcome on board!

Christa Smith Lopez has led the direction of SystemsX.ch’s communication since August 2012. In earlier employment, the 32-year-old from Lucerne has managed various communication tasks at renowned Swiss companies as project manager and editor. Ms. Smith gained a wide expertise and holds a degree in Business Communication from the University of Lucerne.



Her second favorite leisure pursuits are sporting activities like mountain biking and hiking. What she enjoys most though is traveling extensively in foreign countries and cultures.

A warm welcome to Christa!

vdm

All SystemsX.ch Day 2013

On May 13, 2013, the next “All SystemsX.ch Day” will be held in Bern. It is not only researchers and industry partners that SystemX.ch invites to this year’s national networking and information event; the invitation this year includes all members of Life Sciences Switzerland, LS² (formerly the Union of Swiss Societies for Experimental Biology, USGEB).

The one-day event not only offers participants an ideal platform to learn about the current activities of the network organization and to share knowledge. The conference also aims to enable new partners and scientists to make contacts and to lay foundations for new research collaborations.

Wide-ranging scientific program

The scientific program will be complemented with informal contributions. The scientific part will focus mainly on the “Research, Technology and Development Projects” and “Transfer Projects”, approved by the Swiss National Science Foundation in December 2012.

The presentations of these projects will be accompanied by a poster exhibition, which allows young researchers (graduate and postdoc) to present their work to a wider audience. Furthermore this provides an opportunity to present ongoing projects to an expert audience. These include “Bridge 2 Industry Projects”, “Interdisciplinary Pilot Projects”, and the “Research, Technology and Development Projects” of the first and second generations.

There will be awards for the best posters in each category; getting involved will be worth it!

Practical information and well-being

The informal part of the event is dedicated to the theme of the exploitation of



The All SystemsX.ch Day takes place this year in Bern. Photo: © Bern Tourism

research results in SystemsX.ch projects. The invited speakers will reveal opportunities for patents, out-licensing or founding a spin-off company.

The climax of the All SystemsX.ch Day will be a gala evening, where we will be celebrating not just the future of the

new and – certainly successful – projects, but also perhaps the foundation for new applications for a “Research, Technology and Development Project” or a “Transfer Project”, which may be laid in the upcoming announcement this summer.

sel

IMPRESSUM



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All SystemsX.ch Day 2013

May 13, 2013, «Zentrum Paul Klee», Bern



welcome

2nd phase

of SystemsX.ch – be a part of it!

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Presentations of new projects with focus on:

- › Medical & Clinical relevance
- › Knowledge & Technology transfer
- › Modeling & IT



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