

X-Letter

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STRATEGY

SystemsX.ch looks to the future and defines new goals

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FLY WING

«WingX» Project - Simulating wing development on the computer

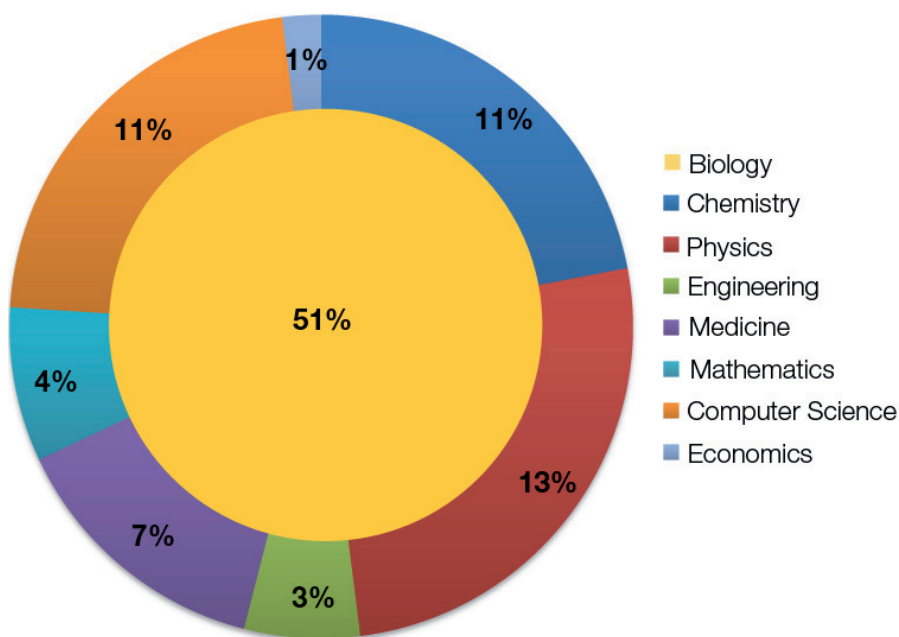
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TEF PLANT

Better grain quality in Ethiopia thanks to Bernese research

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Where is SystemsX.ch after two years? A first situation report.



Of the 246 contenders in the 61 projects supported by SystemsX.ch, around half hold a PhD in biology, 13% in physics, 11% in chemistry and 11% in computer science.

Graphic: NET

Daniel Vonder Mühl

A little more than two years ago SystemsX.ch officially commenced its activities. Shortly after the signing of the agreement in 2007, funds of CHF 100m were released by parliament for the BFI period 2008–2011. Two years later, it was time to write a first appraisal. This does not only serve SystemsX.ch to elaborate future planning but also provided the basis for the first visit of the top-class, internationally appointed Scientific Advisory Board (SAB).

Initiation and the structural creation of the organisation took priority in the first

two years. A few promising projects were launched at the same time. Although no breakthroughs in fundamental research could realistically be expected in so short a time, SystemsX.ch was nevertheless able to announce first scientific successes.

Disciplines

On the strength of the first two calls for proposals a total of 62 projects were granted, which were implemented by more than 250 research teams. Half of the beneficiaries (heads or joint-heads of projects) graduated

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Switzerland's Research Situation

Peter Malama, National Councilor and President of the SIB Foundation

Switzerland's only genuine raw material, it is often said, is knowledge. Indeed, the research carried out at our universities or in the country's private institutions enjoys a high reputation, both nationally and internationally.

The fact that little Switzerland – measured in square kilometres – can achieve world-class results and keep up with its big counterparts in Asia and other regions of the world, as well as in Europe, cannot be taken for granted.

With SystemsX.ch and the Swiss Institute of Bioinformatics the partner universities have created a corporate umbrella. Despite autonomy, specific own interests and different cultures, each and every partner makes an indispensable and important contribution to a unique educational, research and technology forum. Under the label of SystemsX.ch and the premise of «quality first» a remarkable consortium in Systems Biology continues to unfold that functions across disciplines and institutions. It would be commendable if this successful model could be applied to individual disciplines or other fields.

Thank you, esteemed research community and readers, for your contribution to this extremely satisfying situation.

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in biology, and around an eighth in each of physics, chemistry and computer science (cf. figure on page 1). All projects and research teams are listed in a flyer in the SystemsX.ch brochure, as well as on the internet homepage.

Projects and funds

Together with SyBIT, the 14 big RTD projects form the IT-services / research project, the real core of SystemsX.ch. The greater part of the funding, namely CHF81m, goes to this project. For the training and education of young researchers 27 interdisciplinary doctoral grants (IPhDs) have already been awarded and others will follow. More than CHF8m are at the disposal of these projects. A further CHF5m are scheduled for pilot projects, which include the new collaborative projects

with industry. So far, 20 interdisciplinary pilot projects (IPPs) and two «Bridge to Industry» projects have received funding. 88% of the funds accorded by the government have been allocated.

Focus points 2008-2011

The Scientific Executive Board defined four performance goals for the first period:

1. Outstanding research
2. Training and (further) education
3. Collaboration between public and private research
4. International exposure

These goals were to be fulfilled at the projects' level, as well as by the initiative of SystemsX.ch as a whole. Following examples show that these aims have already been successfully

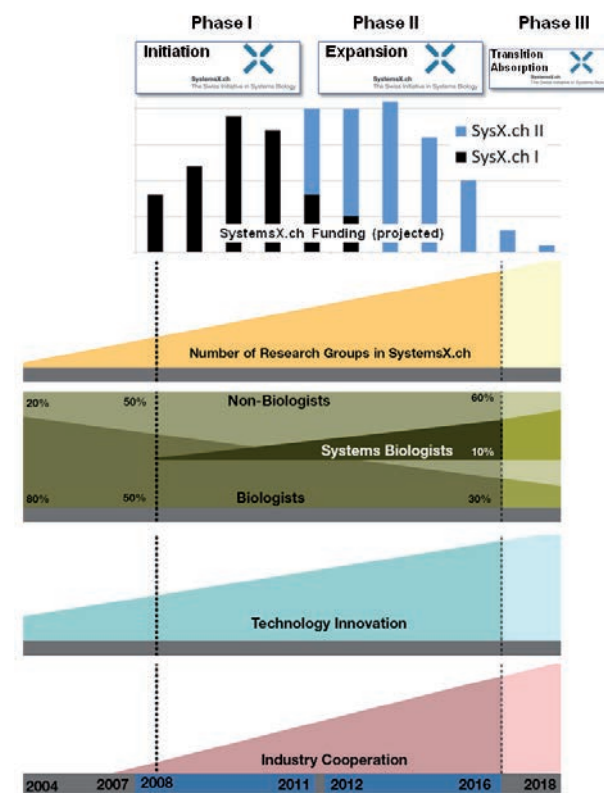
implemented: numerous articles have been published in «Nature», «Science», «Cell» and other renowned journals; a PhD workshop took place in Weggis last September; the company Hoffmann-La Roche is participating in the two RTDs, «LiverX» and «CINA»; and SystemsX.ch received an invitation from Brussels to present the initiative at the «Swiss Science Briefing».

Yet each of the focus points does not simply require the concerted efforts of all those involved; above all it calls for continual and continuous preparatory work. Many of the successes mentioned above were the result of many years of preparation or preliminary projects. This is all the more reason to feel real gratification for the laurels already harvested for the SystemsX.ch projects that have been launched.

SystemsX.ch 2012-2016: Using the momentum gained in the first phase to push ahead with the second

Two years after the first call for project proposals, more than 60 projects have been granted, although some have not yet reached the launch pad. Nonetheless, various boards associated with SystemsX.ch have been busy planning the next stage, due to run from 2012-2016, in order to ensure a smooth continuation. With the backing of the ETH Council, SystemsX.ch has applied for funding for the second phase (2012-2016) amounting to CHF25m p.a., the same amount as for the initial phase. The required strategy paper was submitted to the State Secretariat for Education and Research (SER) at the end of 2009.

After the second tranche was granted to the RTD projects in May 2009, slowly but surely SystemsX.ch began to gain momentum. And already during this initial, setting-up phase, talks were held with representatives from the various boards and



Throughout the expansion phase the number of groups supported by SystemsX.ch is set to rise, the proportion of non-biologists will increase, innovative technologies will be developed and collaboration with the private sector will also increase.

Graphic: VDM

committees. These discussions were about a timely preparation to assure the continuation of SystemsX.ch after 2011. The SER, as the responsible authority, invited SystemsX.ch to submit a consolidated research plan by the end of 2009 for the period 2012-2016, including funding requirements.

Introducing a new culture takes time

Essentially, the program is about the implementation of a paradigm shift towards quantitative and predictive life-science research. The interdisciplinary approach also means that a lasting effect can only be achieved when SystemsX.ch can continue to develop beyond the minimal time frame of the initial phase. Similar conclusions were reached with the national research programs. The emphasis of the second phase builds on what has been done so far (cf. article «Where is SystemsX.ch after two years?») and support the aims of the initiative.

Consolidation

The maxim of the second phase of SystemsX.ch is consolidation: building on what has been achieved in the initial phase. The concrete goals targeted here are:

- Fostering of interdisciplinary and innovative research and development projects of varying magnitudes. These especially include original and creative technological developments.
- Establishing infrastructures and platforms to support Swiss scientists in long-term Systems Biology research.
- Education and training of students for Bachelor, Master and Doctorate degrees, as well as the continuing training of scientists and technicians in both public and private institutions.
- Increased collaboration with companies to support them with the implementation of systems biological approaches.
- Firmly establishing Switzerland as a worldwide leading center for Systems Biology research.

Research and technology platforms

Successful RTD projects from the first phase are to be subjected to an evaluation by an international panel of experts and, provided with new objectives by the Swiss National Science Foundation (SNF), pursued in the second phase of SystemsX.ch. At the same time, SystemsX.ch plans to launch

new RTD projects.

One important aspect of these big projects concerns the construction of technology platforms. Together with the Swiss Institute for Bioinformatics (SIB), SyBIT is to safeguard lasting IT support. Simultaneously, smaller types of projects, such as interdisciplinary pilot projects and joint projects with industry, will continue to be on offer.

Training and continuing education

SystemsX.ch's interdisciplinary doctorate projects are to be turned into fellowships. Instead of funds to a project proposal, grants will be awarded to outstanding students. The doctoral students will work for a short time in two or three research teams before they decide on one, and, under the guidance of a supervisor, plan their dissertation.

New technology platforms, but also research work, require the adaptation of existing courses of study as well as the creation of new. Although this lies in the competence of the universities as far as courses of study are concerned, SystemsX.ch will actively support the universities in their endeavors. In addition, together with private partners, SystemsX.ch plans to offer continuing training courses.

Public-Private-Partnership

The inclusion of the private sector in SystemsX.ch takes time. Companies initially want to get to know the entire program and, based on the outcome, then enter into direct contact with the scientists working on individual projects. The greatest amount of interest here is directed at new kinds of technologies and approaches. For this reason, SystemsX.ch hopes to continue and intensify the company-specific projects BIP und ISA that were introduced recently. In RTD calls for proposals special attention will be paid to the inclusion of private sector researchers.

Beyond the country's borders

Since 2007, the EU has regularly increased its budget for Systems Biology. The success of applications from Swiss researchers is above-average. A lively participation in European associations is to be expected from SystemsX.ch research teams. SystemsX.ch is also to become the responsible instance for international network projects in Systems Biology (ERA-Net and EuroCores). Swiss participants will continue to be funded by the SNF until 2011.

With the second phase of SystemsX.ch the harvest from the first phase will be brought in while, at the same time, new approaches (technology platforms, increased inclusion of private institutions, international aspects) will be incorporated into existing structures.

SystemsX.ch evaluated by the SAB

Franziska Biellmann

On December 3-4, 2009 the Scientific Advisory Board (SAB) met in Zurich to evaluate and discuss the progress, strengths, and weaknesses of the largest Swiss research initiative currently being funded. Five distinguished international scientists make up this board. Fotis Kafatos (Chair), Marvin Cassman, and Albert Osterhaus were able to attend in person, while Eugene Butcher gave valuable written input. Unfortunately, Erin O'Shea was not able to participate. All in all there was a fruitful discussion with various participants in the SystemsX.ch initiative.



SAB members: Cassmann, Kafatos, Osterhaus.

Photo: VDM

Principal Investigators (PI) and students gave updates on their progress; while SystemsX.ch's Scientific Executive Board and Board of Directors members discussed the strategy and progress of the initiative as a whole.

Overall, the SAB seemed reasonably

impressed with our contribution to Systems Biology research in Switzerland. In its final report the SAB wrote «SystemsX.ch is as good as any international systems biology programs, and better than most». We would like to thank all the PIs, PhD students and other scientists who participated in the event. We are happy to hear that the progress made such a good impression on the SAB. We are excited to see that Systems Biology is really growing in Switzerland, and that it is doing so at an internationally competitive level. Although there is always room for improvement, the SAB report shows that we are definitely on the right track.

Computer simulation of wing-development of the fruit fly is a main goal of the «WingX» project



Prof. Hafen and his team taking a close look at wing development.

Photo: msc

Interdisciplinary team: success factor

A first step aims to measure and record the interaction between genes and their products to determine which gene is expressed in which cell of the wing and how strongly. «Only with these results will we be able to explain why, in the end, identical primary cells develop into a range of differentiated wing cells,» says Hafen. The ensuing flood of data is huge and complex. The development of models to handle this is extremely complicated and requires profound knowledge of physics and math. This is why Hafen fosters interdisciplinarity in his team. «Wherever possible we have two PhD students from different disciplines working together on the same project, for example, a biologist and a physicist. Combining the two is

Matthias Scholer When one compares the genome of any two people of the same sex, one discovers something quite remarkable: the genetic difference between the two is miniscule. Only every thousandth letter in the DNA is different. And it is this tiny difference that accounts for the variations within a species? «Yes, it really is amazing how these small deviations in the genetic structure influence our development,» says Ernst Hafen, professor of developmental biology at ETH Zurich. And he attempts a literary comparison; «If we changed every thousandth letter in Tolstoy's War and Peace, it's unlikely that anyone would notice. The same level of change in the genome, though, is at the root of the entire variety of manifestations within a species.» Exactly how this is possible is what systems biologists want to find out.

The fly as an ideal organism

Ernst Hafen and his team are investigating which genes drive the development of a living being to its form and size. The wing development of a small fruit fly, *drosophila*, serves as a model for their research. «We chose this organism because an awful lot is already known about it, thanks to work that has been carried out over the past 100 years. And it functions in a simpler way than a human being. Besides, the *drosophila*'s wing develops as an auton-

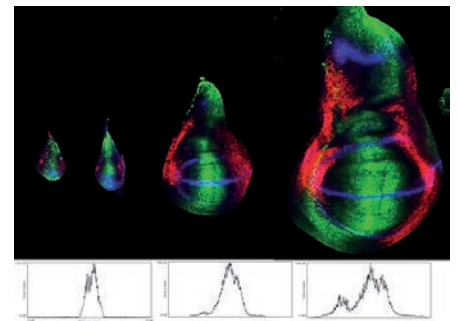
omous body part from clearly defined embryonic cells,» explains Hafen. The embryonic cells can even be stained, which makes it easier to observe each stage of their development. It is known that, from these 20 precursor cells, within the first six days 60'000 cells develop from which the wing is formed within the following four days. But this is the view as seen from the outside. Precisely what is going on in this short space of time within and between the cells is the focus of the project entitled «WingX». «Our aim is



The insects used in the trials are bred at ETH Zurich.

Photo: msc

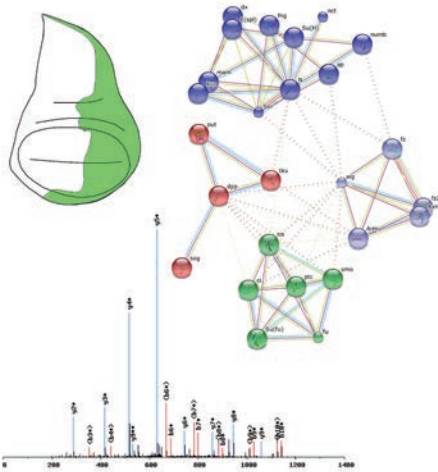
to comprehend the single steps in development and quantify them. At the same time we want to create computer programs that can process the collected data that, in the end, will enable us to simulate the wing-growth on the computer,» is Hafen's summary of the ambitious project.



Morphogen distribution during wing growth.

Graphic: E. Brunner

not only promising for the research results but it's important for the training of the young academics,» elucidates the project leader. Because, for Hafen, it's very plain that a biological system can only truly be understood if one looks at it from different perspectives. In project «WingX», moreover, great store is set on an optimal exchange of information between individual groups. «We must foster a new communications' culture among researchers. It makes no sense to remain in an ivory tower concentrating on being the first-named author of a publication. The sharing of knowledge has to be frank and as continuous as possible,» says Hafen. A requirement that the WingX team can meet thanks to an intensive use of ETH's own Wiki-platform.



Proteomics analysis of slices of wing enables images of the protein network to be captured. Graphic: E. Brunner

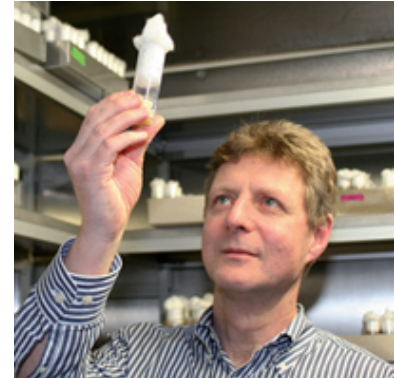
Exciting future prospects

Efforts to create the best possible working atmosphere are bearing fruit. The WingX project is on course. First promising results have emerged and the

individual working groups are beginning to coalesce. Yet what benefits can we expect from the project and the knowledge it delivers? Hafen answers, «WingX's main goal is to be able to model the biological system – or, rather, a part of it to start with – of wing development, in order to be able to simulate the process of development, any errors that occur, as well as the consequences of such errors.»

However, this is only the beginning. Once the biological system of a simple model organism is understood, one can transpose this knowledge onto a human organism. Because, «the syntax of the genetic language between flies and human beings is similar. After all, all the important genetic functions – ours and the fly's – were already in existence 600 million years ago, before our evolutionary paths diverged.» It is therefore conceivable that in the foreseeable future system biologists will be able to test a model that shows how an

organism reacts to a given pharmaceutical substance or determine the most effective combination of medication for a certain patient. Exciting future



Ernst Hafen - Lord of the Flies. Photo: msc

prospects that could also awaken the interest of the pharma-industry. Before that, though, a few generations of flies will have to sacrifice their wings to scientific research.

WingX – Individual groups and their project goals

Proteomics

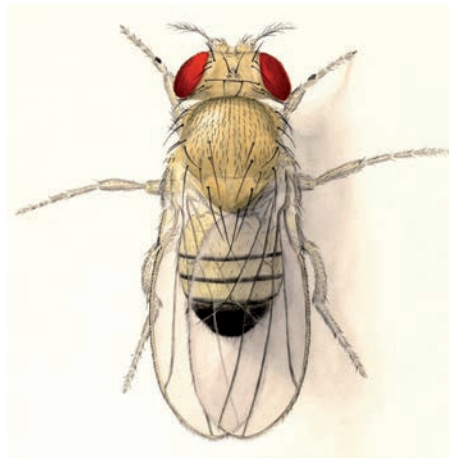
This project aims to identify and measure the proteins that develop during the wing-development process.

Modeling

In this project, existing data is being processed with newly ascertained data to enable a step-by-step simulation of wing development on the computer.

Imaging

This deals with the creation of a method to visualize the entire wing-development process, including gene expression and protein activity.



The fruit fly «Drosophila».

Illustration: WingX

Epigenomics

Measurements of which areas of the genome are turned on (or off) during wing development.

In vitro Culture

Developing micro-culture chambers that allow scientists to observe the development of the wing outside the larva. This means that the development can be observed under the microscope, which simplifies the physical, chemical and genetic processes. msc

«WingX – Systems Biology of the Drosophila Wing» at a glance

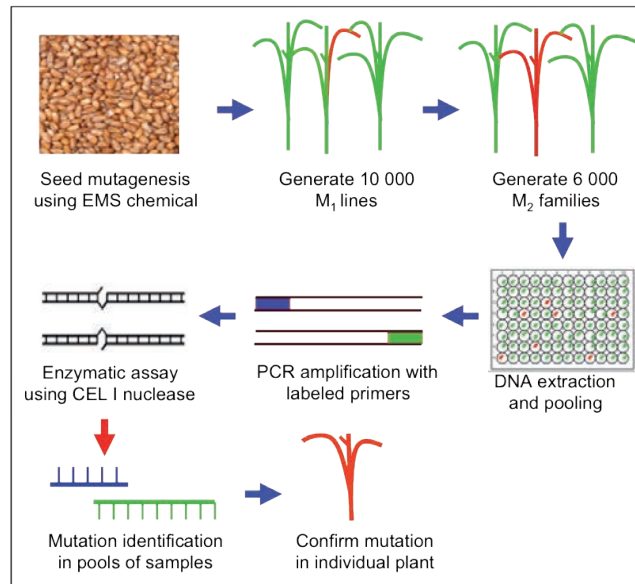


WingX
Systems Biology
of the Drosophila Wing

Principal Investigator	Prof. Ernst Hafen
Involved research groups	ETH Zurich: R. Aebersold, D. Iber, P. Koumoutsakos, I. Sbalzarini, H. Stocker, B. Wollscheid, R. Paro; University of Zurich: C. Aegerter, C. Lehner, S. Luschnig, C. von Mering, E. Brunner, K. Basler, T. Aegerter; EPF Lausanne: D. Floreano, P. Renaud, H. van Lintel; University of Lausanne: S. Bergmann; University of Basel: M. Affolter.
Number of research groups	14
Researchers : Administration	42 : 0.5
Biologists : Non-biologists	1 : 2
Total budget (2008-2011)	13'816'830, thereof 5'150'000 CHF from SystemsX.ch

Scientists from «Plant Growth» are involved in a project to improve crop quality in Ethiopia

Franziska Biellmann
Dr. Zerihun Tadele heads the «Tef biotechnology project» at the Institute of Plant Sciences, University of Bern in the department headed by «Plant Growth» Principal Investigator Prof. Cris Kuhlemeier. For the past three years Dr. Tadele has been involved in a research project aimed to improve the quality of the tef, a very important cereal crop from Ethiopia. In an effort to increase tef yields and help poor farmers in the region a group of scientists have teamed up with the Syngenta Foundation for Sustainable Agriculture in a project entitled «Molecular Breeding and Genomics of Tef». The overall aim of the project is to develop a semi-dwarf tef plant that is resistant to lodging, so that seed yield per unit area can be increased in the farmers' fields in Ethiopia. Now scientists plan to embark on deciphering the complete tef genome.



The TILLING method adopted for Tef Project.

Graphic: Dr. Tadele

Tef is a staple food crop in Ethiopia where it is grown annually on about 2.6 million hectares of land. The crop has advantages for the unique growth conditions in Ethiopia including its durability in dry and water-logged conditions, its resilience to storage pests, resistance to many diseases, and high protein levels

compared to other cereals. So far, tef has been shown to lack the gluten found in wheat products, making it especially suitable for people suffering from celiac disease. For all of these reasons, this crop is crucial to food security, nutrition, and income generation for poor farmers in Ethiopia. However, grow-

ing tef also has significant limitations. Tef produces inferior yield both in terms of quantity and quality. Lodging or permanent displacement of the stem from the upright position which occurs due to wind or rain contributes to the large losses in the harvest. Dwarf varieties of rice and wheat resistant to lodging made considerable contributions to the Green Revolution in the 1960s and 1970s. A similarly significant effect is the goal for semi-dwarf tef lines. Overall the tef project hopes to solve the lodging problem by breeding semi-dwarf tef cultivars with increased stem strength and root anchorage, and ultimately boost the harvest.

The project relies heavily on a technique known as TILLING (Targeting Induced Local Lesions in Genomes), which is a technology to create mutations in organisms for which no genetic resources are available and thus is especially useful for orphan

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Dr. Tadele examining the tef plant.

Photo: SNF

So far the project has been highly successful in achieving its goals. Aims for the next three years of the project include:

- Strengthening the power of TILLING and eco-TILLING by isolating additional candidate genes, identifying individual lines with mutations, and evaluating the phenotypes of individual plants
- Using RNAi for down-regulation or producing knock-outs for use in TILLING, eco-TILLING, and phenotyping
- Completing the sequencing of the tef genome and establishing a database with tef sequence information
- Providing more new genotypes for field tests in Ethiopia to better assess their quality and that of their progeny
- Conducting educational workshops at BecA on TILLING for local scientists

With all of the success this project has had so far we look forward to seeing what the future will bring. This is a great example of science at work for a meaningful humanitarian cause, while at the same time allowing progress on scientific questions.

For more information about the «Molecular Breeding and Genomics of Tef» project please contact:

Dr. Zerihun Tadele
IPS, University of Bern
Email: tadele@ips.unibe.ch
www.botany.unibe.ch

Dr. Andres Binder (Advisor research projects)
Syngenta Foundation for Sustainable Agriculture
Email: andres.binder@unibas.ch
www.syngentafoundation.org

SystemsX.ch meets «Quantitative Proteomics in Time and Space»

Erich Brunner «Quantitative Proteomics in Space and Time» was the topic of a scientific conference jointly organized by the Swiss Proteomics Society, ETH Zurich, and SystemsX.ch from December 2-4, 2009. About 130 participants from twelve countries and over thirty scientific institutions presented their latest achievements in the proteomics field. Four half-day scientific sessions, covering bioinformatics, biomarkers, new trends and technologies in proteomics, as well as systems biology, set the framework for the conference. Invited lectures from leading scientists, as well as locally contributed oral presentations chosen from among the submitted abstracts and two poster sessions yielded an excellent and lively meeting. Twelve partners from industry sponsored the event and rounded off the meeting with a very interesting exhibition.

From malaria via yeast...

The systems biology session on the opening afternoon of December 2 was co-organized by SPS and SystemsX.ch. Coincidentally, the new Scientific Advisory Board (SAB) of SystemsX.ch was meeting in Zurich on that very same date allowing the chairman, Fotis Kafatos (Imperial College, London), to give the opening lecture of the meeting. Prof. Kafatos discussed the importance of interdisciplinary approaches to understanding and curing complex diseases such as malaria, where he presented the latest results in the field.

In the following talk, Paola Picotti (IMSB, ETH Zurich) presented her work that al-

lows global, time-resolved and quantitative measurements of the yeast proteome. The underlying technologies that have been developed in Ruedi Aebersold's laboratory (IMSB, ETH Zurich) hold a strong hope of delivering the quantitative datasets that are urgently needed for accurate modeling of different types of systems and organisms explored by systems biology approaches.



In his short address, Oliver Pertz spoke about «A systems biology view of spatio-temporal signaling during polarized cell migration». By tracking thousands of proteins and phosphorylation sites across the three prototypical polarized cell migration modes his team was able to identify components and signaling cascades relevant for cell migration and to propose how cells translate the corresponding signals into migratory cues.

...to simulation of cell responses

Amos Bairoch presented CALIPHO («Computer and Laboratory Investigation of Proteins of Human Origin»), which recently launched an initiative that aims to unravel the function of mainly uncharacterized human proteins by using bioinformatics approaches in combination with laboratory experiments. CALIPHO is behind a systematic and collective effort to pool available resources around the world in order to functionally characterize the human proteins and to make

the data available through «neXtProt»; a database specifically developed to distribute the information gained in this project.

This exciting session was closed by a presentation from Erez Dekel from the Weizmann Institute of Science (Israel). His work demonstrated the power of a systems approach in unraveling how cells respond to single or multiple drugs. Tracking tagged proteins through an automated imaging approach enabled his team to establish predictive models that allow a precise simulation of the responses of the cells to multiple drug applications. Consequently, the team is able to circumvent the need to measure all the possible drug combinations in cumbersome single experiments.

Continued promotion of knowledge transfer

The next two days of the meeting focused on technology development, bioinformatics, and biomedical applications and allowed the systems biology community to interact with proteomics experts and scientists and exchange information on the more technical aspects of proteomics. Networking opportunities during the coffee breaks in the vendors exhibition, or during the poster sessions strengthened the interactions between biologists and proteomics scientists. This event has clearly shown the convergence of scientific interest between the systems biology and the proteomics community, and the need for similar joint sessions in the future.

For more information on SPS, please visit: www.swissproteomicsociety.org

Tef plant project

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crops such as tef. Currently over 6000 mutagenized populations are being screened using this method. Fifteen candidate mutants have already been identified for two genes under investigation. At the same time eco-TILLING, a technique used to detect useful natural genetic variations to the plants not exposed to an external mutagen, is implemented on 500 tef accessions collected from various tef growing regions. In addition, several semi-dwarf tef lines identified in a screen performed at the Syngenta Greenhouse are being tested for fertility and other important growth parameters at the University of Bern. Seeds from the two promising lines have been handed over to the Ethiopian Institute of Agricultural Research for field work and crosses with local cultivars.

Additional promising tef lines will be field tested in Ethiopia. Sequencing of the tef genome has now started at the Functional Genomics Center in Zurich and as part of the project's knowledge and technology transfer strategy, it will be completed at the new facilities at the Biosciences in Eastern and Central Africa (BeCA) in Nairobi. The annotated sequence will be made available for public use. It will be the first complete sequence of a native African crop and be a great tool for identifying traits of direct benefit to African farmers.

Science in society

If your laboratory is involved in projects benefiting the public with scientific advancements we would like to hear about it.

Please contact us under www.SystemsX.ch and tell us more!

PRAISE AND HONOURS

Swiss Technology Award

FemtoTools AG is among the winners of the Swiss Technology Awards 2009. This prize counts as the most prestigious sign for innovation and technology transfer in Switzerland. This high-tech company, a spin-off of ETH Zurich, received the prize for its development of microsystems, that enable the characterization and handling of microscopically tiny objects. For instance, the systems designed by «FemtoTools» are used to determine protein structures, which in turn, allows researchers to draw conclusions on their biological function. Within a short period the young SME has made a name for itself among scientists all over the world. With the help of strategic partnerships the company now aims to make the transition into the industrial sector. msc

Seeking out potential

With Paola Picotti and Martin Beck ETH Zurich has two of the most promising scientists in Systems Biology research. The two were finalists in a call for proposals from the renowned journal «Genome Technology». The aim of this exercise was a worldwide search for the system biologists with the greatest research potential. From among all candidates a top-class panel chose the most promising. Paola Picotti and Martin Beck work in Prof. Ruedi Aebersold's proteomics group at the ETH Institute of Molecular Systems Biology. In addition, Picotti is one of the team on «PhosphoNetX», a SystemsX.ch RTD project. All of the finalists are introduced in detail in the current issue of «Genome Technology». msc

SystemsX.ch Lecture Series

Internationally renowned speakers, selected issues surrounding Systems Biology, the possibility of listening to the lectures live in the lecture room or in real time over the Internet; these are the most important ingredients of the SystemsX.ch Lecture Series, which take place roughly every three months.

Each event is hosted by an alternate partner institution, whereby the head of the corresponding RTD project invites a distinguished Systems Biology authority as guest speaker. The topic of each lecture is deliberately chosen in order to appeal to as wide an audience as possible

because, in addition to the SystemsX.ch community, the target audiences for these lectures are specialists from related fields of research. The series aims to heighten these experts' awareness of Systems Biology and give them the opportunity of «touching base» in an informal atmosphere with the various interest groups.

The framework conditions of the event are adapted to suit this aim. The lectures are held in rooms with plenty of reserve space and diffused via the Internet with live-streaming. On the one hand, this lowers the threshold for «outsiders» to



follow the presentation in person but it also makes it possible to participate if it clashes with a full diary. Have we awakened your interest? The current program of the series can be downloaded at www.SystemsX.ch. We look forward to your participation! NET

The Lecture Series - Past events:

All past lectures can be found to on our webpage: www.SystemsX.ch/lecture-series

January 2010



Professor Ron Shamir, leads the Computational Genomics Group at the Blavatnik School of Computer Science, Tel Aviv

University (TAU).

Title: «Integrated computational analysis of biological data: from connectivity to cancer.»



December 2009

Professor Fotis Kafatos, Immunogenomics Chair at the Imperial College Institute of Global Health, London, and member of

the SAB of SystemsX.ch

Title: «Omics for Understanding and Controlling Global Health Diseases.»

SystemsX.ch sponsors Summer Course in Computational Biology

In 2010, the annual summer school in computational biology will again take place at the Mediterranean Institute for Life Sciences (MedILS) in Split, Croatia from August 17 to 24, 2010. This week long workshop has enjoyed much popularity and excellent reviews in the past. Previous sponsors include MedILS and FEBS. In 2010, SystemsX.ch will sponsor this course for the first time.

The course will focus on practical implementation and training of methods for modeling and simulating biological systems in space and time. It is targeted at Master students, PhD students, and postdocs with little background in modeling and simulation, and minimal experience in computer use (basic MATLAB skills) and basic mathematics. SystemsX.ch will sponsor



about 20 full fellowships, covering full registration fee plus part of the travel costs. The maximum number of participants is 25 and deadline for application is June 1, 2010. More information under www.SystemsX.ch/events. NET

All-SystemsX.ch-Day 2009

Around 200 visitors met up on the 18th November 2009 at the Inselspital Berne to take part in the third All-SystemsX.ch-Day. Professor Ruedi Aebersold and Dr. Daniel Vonder Mühl met the proceedings in motion with information on activities currently underway in SystemsX.ch. The remainder of the morning was devoted to presentations to do with modeling, the main theme of the event. Researchers talked about their projects and discussed the future of modeling in Systems Biology.

The morning program concluded with an introduction of the well-known project «Blue Brain» from the guest speaker, Professor Henry Markham from EPF Lausanne.

After the lunch break, the focus turned to the new RTD projects, accepted in 2009. Each of the heads of the projects «BattleX», «InfectX», «CINA», «Cell Plasticity», «CycliX» and «MetaNetX» presented their project.

Throughout the entire day participants were free to browse around the poster exhibition and discover further research being done by SystemsX.ch students. All presented posters took



Prof. Walter Senn from the Uni Bern awards the prizes for the poster competition. Photo: Thomas Müller

part in a competition. The winner of the competition was Jean Hausser from the University of Basel. Andrea Brunner and Ry Tweedie-Cullen came in second place and Dan Zheng in third place for his poster.

In addition, the parallel SyBIT function offered the «Screening», «Genomics», «Proteomics» and «Computational Biology» groups the chance to exchange information and best-practice

recipies and discuss strategies. Following on the heels of an excitement-packed day and presentations, as well as the opportunity to forge contacts, the laughter lines of the visitors were put to work.

The comedian Aerschnd Born slipped into the persona of Professor Dr. Dr. Heinz Schwämmli from «ITEM» (Institute of Translations of Essential Meanings) and presented his view of Systems Biology. In his sketch with the profound title of «How 2 X-plain the

language of life», using simple words and a somewhat more complicated Powerpoint presentation, the satirist explained what Systems Biology really is and what this scientific discipline means for Switzerland. The eventful day drew to a relaxed and friendly close with an aperitif and dinner sponsored by Nestlé.

The All-SystemsX.ch-Day 2010 will take place in Geneva on November 1-2, 2010.NET

NEWS

A hearty welcome to the University of Neuchâtel!

The University of Neuchâtel became the youngest partner of SystemsX.ch in November 2009. At its most recent meeting the supervisory board voted unanimously to grant the application for admission. This accession is the logical consequence of the fact that the RTD «Plant Growth» and SystemsX.ch funds was awarded to the research team under Professor Felix Kessler in 2008. In addition, following the second call for applications, SystemsX.ch granted the University of Neuchâtel's interdisciplinary pilot project «RootoX».

msc.

Gentler with testosterone

Research within the SystemsX.ch «Neurochoice» project and the British National Centre of Competence in Effective Sciences shows that the commonly held opinion whereby testosterone is blamed as the cause of aggressive and selfish behaviour is wrong. Rather, researchers working on this project have been able to show that trial subjects with artificially enhanced levels of testosterone behave in a fair and solution-oriented manner.

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Further on: www.SystemsX.ch/MediaReleases

Scientific Executive Board (SEB) approved two projects with industry

Franziska Biellmann In 2009, SystemsX.ch introduced two new project types in an effort to boost interactions with industry. These are the «Bridge 2 Industry Projects» (BIP) and «Industry Sabbatical in Academia» (ISA). The plan is to leave this call open, with deadlines on the first of February, May, August and November. Although time was tight to

prepare a proposal for the first deadline by November 1, 2009, the Management Office received several applications. The SystemsX.ch Scientific Executive Board reviewed these proposals and chose to support two of them.

Dr. Heinz Koepl from EPF Lausanne et al. will be working together with the Novartis Institute for Molecular BioMedical Research on a

project entitled «Rule-based models for drug-target identification: the TOR pathway as a case study». In addition, Dr. Peter Scheiffele from the Biozentrum in Basel received a positive evaluation for his project with F. Hoffmann La Roche called «Identification of Synaptic Core Pathways as Targets for Autism Treatment». Congratulations to these SystemsX.ch scientists!

Third Call for IPHD and IPP Proposals

The Third Call for Proposals published in September 2009 generated 21 IPHD proposals and 7 IPP proposals. The IPHDs are evaluated and approved via the Swiss National Science Foundation. A decision is expected by July 2010. The IPPs are reviewed and chosen by the SystemsX.ch Scientific Executive Board (SEB). A decision on which IPP proposals will be funded can be expected by April 2010.

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Françoise Gisou van der Goot is the winner of the **Marcel-Benoist-Prize 2009**



Award winning scientist, Gisou van der Goot. Photo: Keystone

The Dutch professor of molecular biology heads a laboratory of the Global Health Institute at EPF Lausanne.

She was awarded the prize for her research into the way that bacterial toxins work. On the one hand, Françoise Gisou van der Goot investigated the mechanism by which toxins penetrate cells following an infection and how the cells react to these toxins. On the other, the molecular biologist succeeded in acquiring new insights into the detrimental effect of the anthrax toxin on lung tissue. Among other things, her results will be used to combat bioterrorism.

The Marcel-Benoist-Prize that Françoise Gisou van der

Goot was awarded for this research is often referred to as the «Swiss Nobel Prize» and carries prize money of CHF 100,000.

The prize has been awarded every year since 1920 to honour a scientist established in Switzerland for important scientific work and its «significance for human life.» Professor Françoise Gisou van der Goot is the first woman to win this award and, coincidentally, head of the SystemsX.ch RTD project entitled «LipidX». msc
More information about the Marcel-Benoist-Prize available at: www.marcel-benoist.ch

New science journalist at SystemsX.ch



Matthias Scholer became the newest member of the SystemsX.ch team at the beginning of the year. As Thomas Müller's successor he is responsible for the organisation's communication issues.

Scholer completed his PhD studies with a dissertation at the faculty of veterinary medicine in Berne. This native of Basel then set out as a «journeyman», working as an assistant in various veterinary surgeries. The opportunity arose for him to swap his stethoscope for flip-charts and marketing plans when he changed to the pharma-

ceutical industry. Scholer's duties as product manager with Berna Biotech awakened his interest in communicating scientific results in an understandable language. This is why he decided on intensive studies to further his education in the sphere of communications. He successfully completed a CAS in science journalism at MAZ and a CAS in corporate communications at SPRI. Since then Scholer has regularly written science articles for both popular and scientific media. As a medical editor he also took care of the production of surgical teaching films for human medicine. «I'm thrilled to be learning more about Systems Biology and to transmit this fascinating subject to our target audience in as clear and gripping a way as possible. It's great to belong to the SystemsX.ch-Team» enthuses Matthias Scholer. msc

The Glossary of SystemsX.ch

Research, Technology and Development Project (RTD project): SystemsX.ch's flagship project, multi-year duration.

Interdisciplinary Pilot Project (IPP): Research involving risks. One-year duration.

Interdisciplinary Doctorate (IPhD): Duration of 3 to 4 years.

Board of Directors (BoD): SystemsX.ch's highest steering body composed of the presidents, rectors and directors of all participating institutions.

Scientific Executive Board (SEB): Operative committee composed of scientists from the participating institutions.



SystemsX.ch
The Swiss Initiative in Systems Biology

IMPRESSUM

Matthias Scholer (msc)
Science Journalist

Tel: +41 44 632 42 77
Matthias.Scholer@SystemsX.ch

Natalia Emery Trindade (NET)
Communications

Tel: +41 44 632 02 50
Fax: +41 44 632 15 64
Natalia.Emery@SystemsX.ch

Dr. Daniel Vonder Mühll (VDM)
Managing Director

SystemsX.ch
Tel: +41 44 632 78 88
Daniel.Vondermuehll@SystemsX.ch

SystemsX.ch
Clausiusstr. 45 - CLP D 7
CH-8092 Zurich
Web: www.SystemsX.ch

Contact for newsletter subscription:
Natalia.Emery@SystemsX.ch

Conferences and Events

April 22 -23, 2010	Introduction to Bioinformatics Course	Bristol, UK
May 5-7, 2010	4th annual RNAi & miRNA World Congress	Boston, USA
May 6-7, 2010	2nd annual Epigenetics World Congress	Boston, USA
June 8-9, 2010	3rd annual Cancer Proteomics Conference	Berlin, Germany
August 17 - 24, 2010	SystemsX.ch Summer Course in Computational Biology	Split, Croatia
October 1-2, 2010	SystemsX.ch PhD Student Retreat	Murten, Switzerland
November 1-2, 2010	All-SystemsX.ch-Day 2010	Geneva, Switzerland