Inken Heeb

Interdisciplinary, interinstitutional and international

“SystemsX.ch is a typical ‘child’ of its time”

Within the scope of his PhD studies at the ETH Zurich Institute for the History of Technology, Alban Frei has, for the past two years, been investigating systems biology research in Switzerland. SystemsX.ch is the main focus of his thesis. In his view, the research initiative illustrates the interdisciplinary and interinstitutional networking that takes place in a globalized information society.

Historical research today: Alban Frei at his computer.

Bookshelves are not historian Alban Frei’s idea of the perfect setting to have his picture taken. For him historical research is not about rummaging through old books. In fact, his work requires a computer and the internet, thus connecting him to the globally available knowledge.

The interconnected information society

For the past two years, Alban Frei has been studying research networks, with an emphasis on the history of the emergence of the systems biology initiative SystemsX.ch. An important feature of the initiative is its interdisciplinary and interinstitutional connections based on modern communication technologies. “It’s a research network on a real and on a non-material level”, says Frei, a PhD student in history of technology. “SystemsX.ch makes use of the fiber optic cables that connect the institutes from Bern to Lausanne and Zurich, thus bringing the researchers together on a scientific level.”

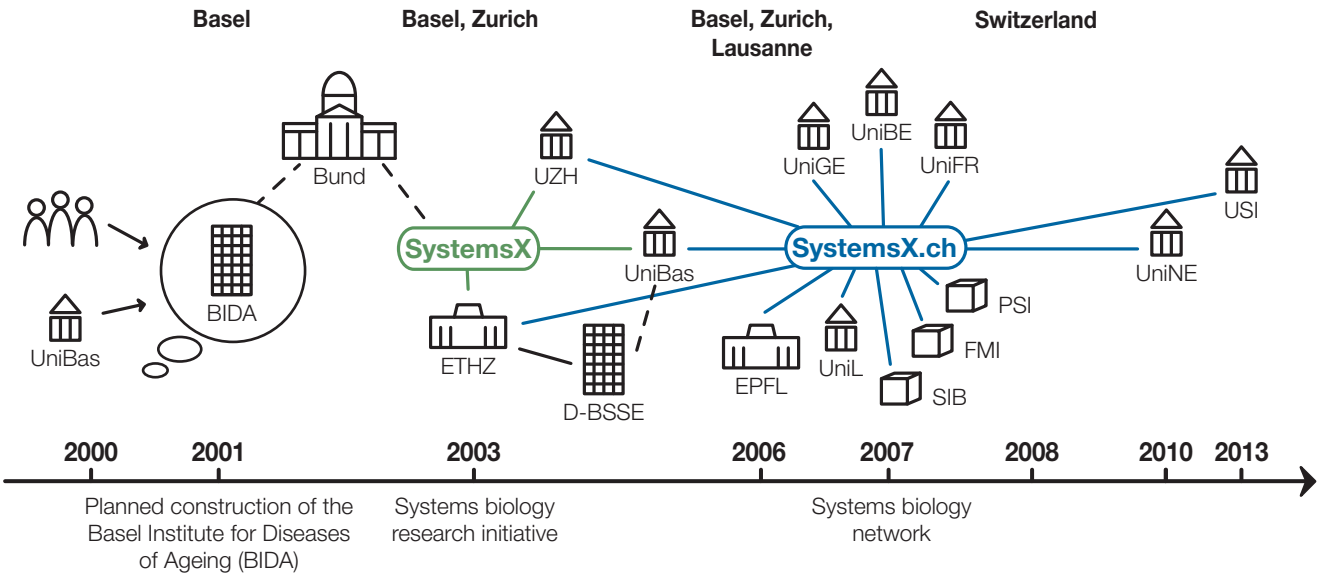
But there is more: the network also draws on computer sciences for research purposes, as systems biology is not only characterized by interdisciplinary collaboration but also by the collecting and analysis of large amounts of data in order to build models of biological processes. It is therefore logical that SyBIT, an IT and bioinformatics project, was developed as part of the initiative. SyBIT provides central services related to the handling of the digital flood of information.

SystemsX.ch acts like a catalyst

Interdisciplinary, interinstitutional and international. “These are characteristic words used to describe scientific practice in the 21st century. They equally describe the present state of SystemsX.ch”, explains Alban Frei. This research initiative, shaped by networks, is a typical “child” of the internet age and an epitome of the thought pattern typical of a globalized information society. SystemsX.ch acts like a catalyst. The initiative promotes networks between scientists while making them visible to others.

Economic and scientific changes

The initiative had to cover a considerable distance before reaching its present size. “The onset on the research policy and social levels took place in the late 1990s”, explains Frei. “Globalization pressure was increasing and was accompanied, in Switzerland, by a phase of economic uncertainty and reorganization in the area of life sciences.” The closing, in 1995, of the molecular biology research institute belonging to the F. Hoffmann-La Roche chemical



company in Basel and the merger between the chemical companies CIBA Geigy AG and Sandoz to create Novartis in 1996 are amongst the most far-reaching events of the time. In the year 2000, Roche also shut down its second Swiss research institute, the world-famous Institute for Immunology (BII). And, in 2002, Novartis transferred part of its research activities from Basel to the United States. "All these events provided the fertile political grounds for the establishment of an initiative in the promising field of post-genomic life sciences. Initially, its nucleus was the region around Basel, influenced by the pharmaceutical and medical branches."

The research initiative's nucleus

Owing to these changes, the idea for the foundation of the Basel Institute for Diseases of Ageing (BIDA) arose in Basel after the turn of the century. This institute was to strengthen the city as an economic and scientific location, and to pursue research in the field of applied life sciences. Ultimately, the BIDA did not come into being, but promoted the consensus for a life science initiative supported by the Swiss Confederation.

Against this background and during a collaboration of the Universities of Basel and Zurich with the ETH Zurich, a systems biology initiative, named SystemsX, was founded in 2003. In a first expansion phase, the EPF Lausanne joined the initiative in 2006. The Universities of Bern, Geneva, Lausanne and Fribourg as well as the Friedrich Miescher Institute for Biomedical Research, the Paul Scherrer Institute and the SIB Swiss Institute of Bioinformatics followed only one year later. Within a few years the cooperation between three universities had developed into a countrywide research initiative. This is also illustrated in the "ch" addition to the name, resulting in SystemsX.ch.

Systems biology as a national research focus

"It was a complex negotiation process between various people and institutions", reports Frei. But by 2007, SystemsX.ch had taken shape and was allocated 100 million Swiss francs for systems biology research between 2008 and 2012. Since then, SystemsX.ch has managed to establish itself as a broad-based initiative, and has in the meantime been extended until the end of 2016 and been endowed with an additional 120 million francs to support the research and education of budding systems biologists. Today, SystemsX.ch unites well over 1000 scientists across the country in approximately 150 projects carried out in 13 partner institutions and represents these in the EU-wide ERASysAPP systems biology network.

"The present size of the initiative speaks well for the significance of SystemsX.ch", says Alban Frei. Over the past years, SystemsX.ch has created new structures in the research sector and promoted the establishment of the systemic approach in life sciences. The format of the call for research projects, requiring interdisciplinary and interinstitutional collaboration, has proven successful and has thus given rise to a complex systems biology research network.

A PhD thesis on SystemsX.ch

Project: "Visible Networks. Research Policy and Life Sciences in the 21st Century" PhD thesis on the subject of systems biology research in Switzerland, with a particular focus on SystemsX.ch.

PhD student: Alban Frei at the ETH Zurich Institute for the History of Technology

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