



SystemsX.ch
Project Overview
2nd Generation Projects
from 2012 onwards



Research, Technology and Development (RTD) Projects



AgingX
Systems Genetics
Approach to
the Biology of Aging

Principal investigator
Prof. Bart Deplancke
Laboratory of Systems Biology
and Genetics
EPF Lausanne
bart.deplancke@epfl.ch

Partners
EPFL, UniL

Scientific fields

- Biology of aging
- Genetic and phenotypic variation
- Systems genetics
- Regulatory genomics
- Metabolism

Technologies
High-throughput sequencing,
metabolomics, statistical genetics,
network modeling

Approved 2013



HostPathX
Modeling and Manipulating
the Phagocyte-Mycobacteria
Interface

Principal investigator
Prof. Thierry Soldati
Department of Biochemistry
University of Geneva
thierry.soldati@unige.ch

Partners
UniGE, UZH, TU Darmstadt, SIB

Scientific fields

- Host-pathogen interactions
- Metabolism
- Bacterial virulence
- Innate immunity
- Engineering
- Anti-infection drugs

Technologies
Infection monitoring, live cell
microscopy, molecular genetics,
high-throughput dual RNA-sequencing,
bioinformatics, mathematics
and modeling, small compound
screening, model systems

Approved 2013



MalarX
Systems Medicine of
Malaria

Principal investigator
Prof. Vassily Hatzimanikatis
Laboratory of
Computational Systems
EPF Lausanne
vassily.hatzimanikatis@epfl.ch

Partners
EPFL, UniGE, UniBE

Scientific fields

- Engineering
- Medical microbiology
- Malaria
- Metabolomics
- Molecular parasitology
- Cell biology

Technologies
Mathematics and modeling, live
and intravital microscopy, 3D cell
culture, LC-MS/MS

Approved 2013



MERIC
Mechanisms of
Evasive Resistance
in Cancer

Principal investigator
Prof. Niko Beerenwinkel
Department of Biosystems
Science and Engineering
ETH Zurich
niko.beerenwinkel@bsse.ethz.ch

Partners
ETHZ, UniBas

Scientific fields

- Hepatocellular carcinoma
- Signaling pathways
- Liver cancer
- Genetic tumor progression
- Genomics
- Phosphoproteomics

Technologies
Mathematics and modeling

Approved 2013



MicroScapesX
Design and Systems Biology
of Functional Microbial
Landscapes

Principal investigator
Prof. Jan Roelof van der Meer
Department of Fundamental
Microbiology
University of Lausanne
janroelof.vandermeer@unil.ch

Partners
Unil, EPFL, ETHZ, CHUV

Scientific fields

- Experimental microbiology
- Environmental sciences
- Medical microbiology
- Synthetic ecology
- Bioremediation
- Metabolomics

Technologies
Experimental biology, mathema-
tics and modeling, genomics

Approved 2013



MorphogenetiX
Modeling the
3-Dimensional Shaping
of Tissue Systems

Principal investigator
Prof. Damian Brunner
Institute of Molecular Life
Sciences
University of Zurich
damian.brunner@imls.uzh.ch

Partners
UZH, UniBas, MPI Cologne

Scientific fields

- Embryology
- Cell-to-cell variability
- Intestinal organoids
- Wing imaginal discs
- Embryonic dorsal closure
- Cell biology

Technologies
Mathematics and modeling, 3D
tissue morphogenesis, cell-to-cell
variability, 3D live fluorescence
imaging

Approved 2013



SignalX
Model-Driven
Experimental Design
of TOR Signaling

Principal investigator
Prof. Uwe Sauer
Institute of Molecular Systems
Biology
ETH Zurich
sauer@imsb.biol.ethz.ch

Partners
ETHZ, UniGE

Scientific fields

- Engineering
- Cell signaling
- Proteomics
- Metabolomics

Technologies
Mathematics and modeling,
computational biochemistry

Approved 2013



TargetInfectX
Multi-Pronged Perturbation
of Pathogen Infection
in Human Cells

Principal investigator
Prof. Christoph Dehio
Biozentrum
University of Basel
christoph.dehio@unibas.ch

Partners
UniBas, ETHZ, UZH

Scientific fields

- RNA interference
- miRNA
- Bacterial infection
- Signaling pathway reconstruction
- Anti-infectives
- Cell Biology

Technologies
Computational biology, genomics,
mathematics and modeling

Approved 2013



TbX
Systems Biology of
Drug-resistant Tuberculosis
in the Field

Principal investigator
Prof. Sébastien Gagneux
Medical Parasitology and Infection
Biology, Swiss Tropical and Public
Health Institute (Swiss TPH)
University of Basel
sebastien.gagneux@unibas.ch

Partners
UniBas, ETHZ, BioVersys AG

Scientific fields

- Genomic epidemiology
- Experimental microbiology
- Population genomics
- Functional genomics
- Computer sciences
- Mathematics and modeling

Technologies
Transcriptomics, proteomics,
lipidomics, metabolomics

Approved 2013



AntibodyX
Systems Biology of
Humoral Immunity

Principal investigator
Prof. Sai Reddy
Department of Biosystems
Science and Engineering
ETH Zurich
sai.reddy@bsse.ethz.ch

Partners
ETHZ, UZH

Scientific fields

- Clinical immunology
- Clinical immunopathology
- Engineering
- Molecular biology

Technologies
Genomics, mathematics and
modeling, computational
biochemistry

Approved 2012



EpiPhysX
The Physics of Epithelia

Principal investigator
Prof. Michel Milinkovitch
Department of Genetics & Evolution
University of Geneva
michel.milinkovitch@unige.ch

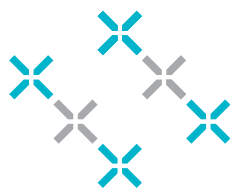
Partners
UniGE, UZH, SIB

Scientific fields

- Engineering
- Developmental biology
- Embryology
- Zoology
- Biophysics
- Cellular biology

Technologies
Computer sciences, mathematics and modeling

Approved 2012



LipidX
Systems Biology of Biomembranes

Principal investigator
Prof. Gisou van der Goot
Global Health Institute
EPF Lausanne
gisou.vandergoot@epfl.ch

Partners
EPFL, UZH, UniGE

Scientific fields

- Lipidomics
- Proteomics
- Cell signaling
- Metabolomics
- Cell biology
- Mathematical modeling

Technologies
Computational biochemistry, mathematics and modeling

Approved 2012



MecanX
Understanding Physics of Plant Growth

Principal investigator
Prof. Ueli Grossniklaus
Institute of Plant Biology
University of Zurich
grossnik@botinst.uzh.ch

Partners
UZH, ETHZ, IBM, FemtoTools AG

Scientific fields

- Engineering
- Plant growth
- Microelectronics
- Biophysics
- Cell biology
- Computational biochemistry

Technologies
Cellular force microscopy, micro-electronic mechanical systems (MEMS), multifrequency AFM, microrobotics

Approved 2012



NeuroStemX
Systems Biology of Forebrain Development

Principal investigator
Prof. Verdon Taylor
Department of Biomedicine
University of Basel
verdon.taylor@unibas.ch

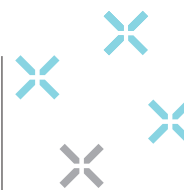
Partners
UniBas, ETHZ

Scientific fields

- Engineering
- Developmental biology
- Brain patterning
- Signaling

Technologies
Single cell RNA-Seq, genomics, transgenics, mathematics and modeling, microfluidics

Approved 2012



PhosphoNet PPM
Personalized-Precision Medicine

Principal investigator
Prof. Ruedi Aebersold
Institute of Molecular Systems Biology
ETH Zurich
ETH Zurich
aebersold@imsb.biol.ethz.ch

Partners
ETHZ, UZH, KSSG, University of Cologne

Scientific fields

- Experimental cancer research
- Personalized medicine
- Biomarker
- Proteomics

Technologies
Computer sciences, mathematics and modeling, imaging

Approved 2012



PlantGrowth2
in a Changing Environment

Principal investigator
Prof. Cris Kuhlemeier
Institute of Plant Sciences
University of Bern
cris.kuhlemeier@ips.unibe.ch

Partners
UniBE, UniL, UniFR, ETHZ

Scientific fields

- Botany
- Biophysics
- Agricultural and forestry sciences
- Genomics

Technologies
Computer sciences, mathematics and modeling, imaging

Approved 2012



StoNets
Controlling and Exploiting Stochasticity in Gene Regulatory Networks

Principal investigator
Prof. Mihaela Zavolan
Biozentrum
University of Basel
mihaela.zavolan@unibas.ch

Partners
UniBas, EPFL, UniL

Scientific fields

- Gene expression
- Regulatory networks
- Circadian rhythms
- Cellular reprogramming
- miRNAs
- Single cell imaging

Technologies
Single cell analysis, computer sciences, mathematics and modeling

Approved 2012



SynaptiX
Systems Biology of Forgetting

Principal investigator
Prof. Simon Sprecher
Department of Biology
University of Fribourg
simon.sprecher@unifr.ch

Partners
UniFR, UniBE, University of Nevada

Scientific fields

- Engineering
- Cytology
- Synaptic plasticity
- Transcriptomics
- Neurogenetics
- Genomics
- Cell biology

Technologies
Super resolution microscopy, mathematics and modeling

Approved 2012



SysGenetiX
Cellular Systems Genetics in Humans

Principal investigator
Prof. Emmanouil Dermitzakis
Department of Genetic Medicine and Development
University of Geneva Medical School
emmanouil.dermitzakis@unige.ch

Partners
UniGE, EPFL, UniL, MIT

Scientific fields

- Cytology
- Genome variation
- Systems genetics
- Local regulatory networks
- Medicine
- Genomics
- Cell biology

Technologies
Computer sciences, mathematics and modeling

Approved 2012



TubeX
Multiscale Biophysics of Microtubule Dynamics

Principal investigator
Prof. Yves Barral
Institute of Biochemistry
ETH Zurich
yves.barral@bc.biol.ethz.ch

Partners
ETHZ, PSI

Scientific fields

- Microtubule cytoskeleton
- Saccharomyces cerevisiae
- Cytoskeleton
- Proteomics
- Cell biology

Technologies
Molecular genetics, X-ray crystallography, mathematics and modeling, imaging

Approved 2012

Medical Research and Development (MRD) Projects



AneuX
Shape as Biomarker
for Aneurysm Disease

Principal investigator

CC Dr. med. Philippe Bijlenga
Department of Clinical
Neurosciences
Geneva University Hospitals
philippe.bijlenga@hcuge.ch

Partners

UniGE/HUG, ZHAW, UZH, ETHZ,
UniGE, UZH/USZ

Scientific fields

- Intracranial aneurysm
- Image biomarker
- Mechano-biological transduction
- Shape analysis

Technologies

Disease modeling, vessel wall remodeling, database validation, pathway modeling, statistical modeling, fluid-structure modeling

Approved 2014



GutX
Systems Biology of
Inflammatory
Bowel Disease

Principal investigator

**Prof. Dr. med.
Andrew Macpherson**
Gastroenterology & Mucosal
Immunology, Inselspital
University of Bern
andrew.macpherson@insel.ch

Partners

UniBE/Inselspital, ETHZ, SIB

Scientific fields

- Commensal microbiota
- Metabolomics
- Inflammatory bowel disease
- Intestinal microbiology
- Metabolic pathways
- Nutrition

Technologies

Stable isotope tracing, metabolic modeling, gnotobiotics, axenics, metagenomics, metatranscriptomics

Approved 2014



HDL-X
Systems Biology of
High Density Lipoproteins

Principal investigator

**Prof. Dr. med.
Arnold von Eckardstein**
Institute of Clinical Chemistry
University Hospital Zurich
arnold.voneckardstein@usz.ch

Partners

UZH/USZ, ETHZ

Scientific fields

- Atherosclerosis
- Diabetes
- Lipoproteins
- Transcriptomics
- Proteomics
- Lipidomics
- Signal transduction

Technologies

RNA sequencing, mass spectrometry, bioassays of cellular functions, bioinformatics

Approved 2014



HIV-X
Deciphering Host-Virus
Interactions to
Cure HIV

Principal investigator

**Prof. Dr. med.
Huldrych Günthard**
Division of Infectious Diseases
and Hospital Epidemiology
University Hospital Zurich
huldrych.guenthard@usz.ch

Partners

UZH/USZ, ETHZ, EPFL, UZH,
UniBas, SIB, IBM

Scientific fields

- HIV type 1
- Viral reservoir
- Viral latency
- HIV-1 genetics
- Personalized treatment
- Host-virus interactions

Technologies

Machine learning models, genome-wide association study, next-generation sequencing, exome sequencing, statistical and causal relations, large-scale regression model

Approved 2014



MelanomX
Tumour Microenvironment
Crosstalk in Melanoma
Adaptive Resistance

Principal investigator

Prof. Dr. med. Olivier Michielin
University of Lausanne and SIB
Swiss Institute of Bioinformatics
olivier.michielin@isb-sib.ch

Partners

Unil/CHUV, SIB, UniL, EPFL

Scientific fields

- Adaptive resistance of cancer
- Tumor microenvironment
- Bioinformatics
- Systems biology
- Systems medicine
- Translational melanoma research

Technologies

High-throughput sequencing, single cell technology, protein targets, clinical trials

Approved 2014



MetastasiX
Systems Biology of
Breast Cancer

Principal investigator

PD Dr. med. Walter Paul Weber
Breast Center
University Hospital Basel
walter.weber@usb.ch

Partners

UniBas/USB, UniBas, UZH, FMI,
SIB, IBM

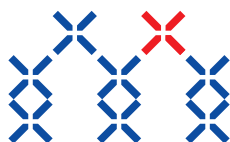
Scientific fields

- Breast tumor heterogeneity
- Systems biology
- Metastasis

Technologies

Mathematical modeling, RNA sequencing, mass cytometry

Approved 2014



PrionX
Systems Biology
of Prion Diseases

Principal investigator

Prof. Dr. med. Adriano Aguzzi
Institute of Neuropathology
University Hospital Zurich
adriano.aguzzi@usz.ch

Partners

UZH/USZ, UZH, UniL, SIB,
University of Cambridge

Scientific fields

- Systems medicine
- Prion diseases
- Transcriptomics
- Microfluidics

Technologies

CRISPR-CAS9, drug screening, data integration, in silico analysis

Approved 2014



StemSysMed
Systems Approach to
Hematopoietic
Stem Cell Diseases

Principal investigator

Prof. Dr. med. Radek Skoda
Department of Biomedicine
University Hospital Basel and
University of Basel
radek.skoda@unibas.ch

Partners

UniBas, UZH/USZ, ETHZ,
UniBas/USB

Scientific fields

- Hematopoiesis
- Stem cells
- Cancer
- Aging
- Modeling of stem cell dynamics

Technologies

Next-generation sequencing, single cell analyses, mouse models of disease, xenograft models, artificial stem cell niche

Approved 2014



VirX
A Host-Directed
Approach Against
Viral Disease

Principal investigator

Prof. Patrick Matthias
Friedrich Miescher Institute for
Biomedical Research
patrick.matthias@fmi.ch

Partners

FMI, UZH, UniGE/HUG, ETHZ,
Unil/CHUV

Scientific fields

- Influenza
- Host-virus interaction
- HDAC6
- Ubiquitin
- Aggresome
- Proteasome

Technologies

Protein analysis, advanced microscopy, cellular and biochemical assays and screens, transgenic mice generation and analysis, clinical samples analysis, mathematical modeling

Approved 2014

Transfer Projects (TF)

Harnessing the immunome's potential to fight cancer: evaluating synergistic antibody drug conjugate – immunotherapy treatments for cancer by comprehensive systems biology analysis

Collaboration between Prof. Alfred Zippelius
University Hospital Basel/
University of Basel
and
NBE-Therapeutics

Scientific fields, keywords

- antibody drug conjugates
- immunotherapy
- cancer
- immune response
- tumor microenvironment

Approved 2014

MoDeLoMX: MacrOphage DiffErenciation LOGical Modeling

Collaboration between Prof. Ioannis Xenarios
SIB Swiss Institute of Bioinformatics
and
F. Hoffmann – La Roche Ltd.

Scientific fields, keywords

- Modeling regulatory network
- Experimental design

Approved 2014

Foes or friends? Reprogramming tumor-associated macrophages to fight cancer by targeted signaling network modulation

Collaboration between Prof. Bernd Bodenmiller
University of Zurich
and
F. Hoffmann – La Roche Ltd.

Scientific fields, keywords

- Medicine
- Tumor associated Macrophages
- Single cell analysis
- Reprogramming
- Drug screening
- Signaling network analysis

Approved 2013

Mechanisms of cancer drug resistance

Collaboration between Dr. Matthias Gstaiger
ETH Zurich
and
Novartis Pharma AG

Scientific fields, keywords

- Drug resistance
- Biomarkers
- Personalized medicine
- Mass spectrometry
- Proteomics
- Cancer therapy
- PI3K signaling

Approved 2013

EvolutionX – analyzing evolution of adaptation to a novel siderophore antibiotic in Gram-negative bacteria by next-generation sequencing

Collaboration between Dr. Marc Creus
University of Basel
and
Basilea Pharmaceutica International Ltd.

Scientific fields, keywords

- Genomics
- Transcriptomics
- Laboratory evolution
- Next-generation sequencing
- Antibiotics
- Antibiotic resistance

Approved 2012

In vivo endoscopic fluorescence imaging in the dopamine system of the healthy and diseased brain

Collaboration between Prof. Fritjof Helmchen
University of Zurich
and
F. Hoffmann – La Roche Ltd.

Scientific fields, keywords

- Fluorescence imaging
- 2-photon microscopy
- Calcium indicator
- Neocortex
- Striatum
- Dopamine

Approved 2012

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

Collaboration between Prof. Alex Soltermann
University Hospital Zurich
and
IBM Research – Zurich

Scientific fields, keywords

- Lung cancer
- Immunohistochemistry
- Microfluidic probe
- Oncogenic mutation
- Predictive biomarker

Approved 2012

Statistical reverse engineering of the signaling network involved in cachexia

Collaboration between Prof. Heinz Wolfgang Koeppl
Technical University of Darmstadt
Prof. Ruedi Aebersold
ETH Zurich
and
Novartis Pharma AG

Scientific fields, keywords

- Mathematics
- Reverse engineering
- Molecular biology

Approved 2012

International Projects within ERASysAPP

ROBUSTYEAST: Optimizing metabolic regulation in yeast production strains for dynamic conditions

Project consortium coordinator Prof. Steffen Waldherr
Otto-von-Guericke-Universität Magdeburg, Germany

Swiss consortium partner Prof. Vassily Hatzimanikatis
EPF Lausanne

Approved 2015

RootBook: Systems analysis of peptide-mediated cell-cell communication in the plant root by in situ sequencing

Project consortium coordinator Prof. Manfred Claassen
ETH Zurich

Swiss consortium partner Prof. Manfred Claassen
ETH Zurich

Approved 2015

FAIRDOM: Next generation of data and model management services in Europe

Project consortium coordinator Prof. Carole Goble

University of Manchester, GB

Swiss consortium partners

Dr. Lars Malmström

University of Zurich

Dr. Peter Kunszt

University of Zurich and SIB Swiss Institute of Bioinformatics

Dr. Bernd Rinn

ETH Zurich and SIB Swiss Institute of Bioinformatics

Approved 2014

MetApp: Systems biology of bacterial methylophony for biotechnological products from methanol

Project consortium coordinator Prof. Trygve Brautaset

SINTEF Materials and Chemistry, Norway

Swiss consortium partner Prof. Julia Vorholt

ETH Zurich

Approved 2014

SysMetEx: Systems biology of acidophile biofilms for efficient metal extraction

Project consortium coordinator Prof. Mark Dopson

Linnaeus University, Sweden

Swiss consortium partner Prof. Igor Pivkin

Università della Svizzera italiana

Approved 2014

SysMilk: Designer microbial communities for fermented milk products: a systems biology approach

Project consortium coordinator Dr. Kiran Patil

European Molecular Biology Laboratory, Germany

Swiss consortium partner Prof. Uwe Sauer

ETH Zurich

Approved 2014

SysVirDrug: Translating systems virology data into broad-spectrum antiviral drugs

Project consortium coordinator Prof. Lars Kaderali

Technische Universität Dresden, Germany

Swiss consortium partner Prof. Niko Beerenwinkel

ETH Zurich

Approved 2014

Transition Postdoc Fellowships (TPdF)

<p>A systems biology approach to the regulation of compartmentalization through liquid phase transitions</p> <p>Principal investigator Dr. Reinoud de Groot University of Zurich</p> <p>Host research group Prof. Lucas Pelkmans University of Zurich</p> <p>Approved 2015</p>	<p>Exploring the silent fitness landscape</p> <p>Principal investigator Dr. Victor Garcia ZHAW</p> <p>Host research group Dr. Maria Anisimova ZHAW</p> <p>Approved 2015</p>	<p>Modeling mechano-biology of the artery to drive the design of novel bioresorbable stents</p> <p>Principal investigator Dr. Gautham Sivachander Yepuri Ramesh ZHAW</p> <p>Host research group Dr. Sven Hirsch ZHAW</p> <p>Approved 2015</p>	<p>Molecular signalling fingerprinting of human hematopoietic stem cell fate</p> <p>Principal investigator Dr. Weijia Wang ETH Zurich</p> <p>Host research group Prof. Timm Schroeder ETH Zurich</p> <p>Approved 2015</p>	<p>Reconstituting ESCRT-III-mediated membrane fission in vitro</p> <p>Principal investigator Dr. Joachim Moser von Filseck University of Geneva</p> <p>Host research group Prof. Aurélien Roux University of Geneva</p> <p>Approved 2015</p>
<p>Single cell analysis of the onset of circadian oscillations in differentiating ES cells</p> <p>Principal investigator Dr. Eric Paquet EPF Lausanne</p> <p>Host research group Prof. Felix Naef EPF Lausanne</p> <p>Approved 2015</p>	<p>Targeted intron retention as a novel mechanism for neuronal plasticity</p> <p>Principal investigator Dr. Oriane Mauger University of Basel</p> <p>Host research group Prof. Peter Scheiffele University of Basel</p> <p>Approved 2015</p>	<p>Targeting bottlenecks in the evolution of metastatic potential – modeling meta-static signaling networks with imaging mass cytometry</p> <p>Principal investigator Dr. Hartland Jackson University of Zurich</p> <p>Host research group Prof. Bernd Bodenmiller University of Zurich</p> <p>Approved 2015</p>	<p>Adaptive noise cancellation in synthetic biomolecular circuits</p> <p>Principal investigator Dr. Christoph Zechner ETH Zurich</p> <p>Host research group Prof. Mustafa Khammash ETH Zurich</p> <p>Approved 2014</p>	<p>Exploiting signaling dynamics to overcome robustness of oncogenic networks</p> <p>Principal investigator Dr. Rohitha SriRamaratnam University of Basel</p> <p>Host research group Prof. Matthias Wymann University of Basel</p> <p>Approved 2014</p>
<p>High-throughput super-resolution imaging reveals contextual effects in gene expression</p> <p>Principal investigator Dr. Kyle Douglass EPF Lausanne</p> <p>Host research group Prof. Suliana Manley EPF Lausanne</p> <p>Approved 2014</p>	<p>Mediation of specificity in mRNA translation by heterogeneous ribosomes</p> <p>Principal investigator Dr. Joao Guimaraes University of Basel</p> <p>Host research group Prof. Mihaela Zavolan University of Basel</p> <p>Approved 2014</p>	<p>Membrane-based memory formation in bacteria: scaling up from single-cell behavior to the dynamics of populations</p> <p>Principal investigator Dr. Susan Schlegel ETH Zurich</p> <p>Host research group Prof. Martin Ackermann ETH Zurich</p> <p>Approved 2014</p>	<p>Systems biology of scaling: biophysics of gradient expansion</p> <p>Principal investigator Dr. Maria Luisa Merino University of Geneva</p> <p>Host research group Prof. Marcos Gonzalez-Gaitan University of Geneva</p> <p>Approved 2014</p>	<p>The thermodynamic underpinnings of enzyme-enzyme interactions and substrate channeling</p> <p>Principal investigator Dr. Elad Noor ETH Zurich</p> <p>Host research group Prof. Uwe Sauer ETH Zurich</p> <p>Approved 2014</p>
<p>3D mass cytometry – a new technology for multi-parameter tissue imaging</p> <p>Principal investigator Dr. Serena Di Palma University of Zurich</p> <p>Host research group Prof. Bernd Bodenmiller University of Zurich</p> <p>Approved 2013</p>	<p>4-dimensional analysis of neural stem cell commitment in the developing telencephalon</p> <p>Principal investigator Dr. Marion Betizeau ETH Zurich</p> <p>Host research group Prof. Dagmar Iber ETH Zurich</p> <p>Approved 2013</p>	<p>Applications of network reconstruction, graph theoretic analysis and qualitative modelling to virus-host interaction networks</p> <p>Principal investigator Dr. Maria Pamela Dobay SIB Swiss Institute of Bioinformatics</p> <p>Host research group Dr. Mauro Delorenzi SIB Swiss Institute of Bioinformatics</p> <p>Approved 2013</p>	<p>Assessing the impact of cancer-associated mutations on the kinase interaction networks</p> <p>Principal investigator Dr. Marija Buljan ETH Zurich</p> <p>Host research group Prof. Ruedi Aebersold ETH Zurich</p> <p>Approved 2013</p>	<p>Computational fate prediction of embryonic stem cell subpopulations</p> <p>Principal investigator Dr. Stavroula Skylaki ETH Zurich</p> <p>Host research group Prof. Timm Schroeder ETH Zurich</p> <p>Approved 2013</p>
<p>Expounding epigenetiX</p> <p>Principal investigator Dr. Dimitrios Spiliotopoulos University of Zurich</p> <p>Host research group Prof. Amedeo Caflisch University of Zurich</p> <p>Approved 2013</p>	<p>Interplay between lipid composition and ER structure and function: a systems approach</p> <p>Principal investigator Dr. Maria Eugenia Zaballa EPF Lausanne</p> <p>Host research group Prof. Gisou van der Goot EPF Lausanne</p> <p>Approved 2013</p>	<p>Mathematical modeling of population epigenetics</p> <p>Principal investigator Dr. Önder Kartal University of Zurich</p> <p>Host research group Prof. Ueli Grossniklaus University of Zurich</p> <p>Approved 2013</p>	<p>Morphogenesis of monolayer epithelia: models and experiments</p> <p>Principal investigator Dr. Séverine Urdy University of Zurich</p> <p>Host research group Prof. Christof Aegerter University of Zurich</p> <p>Approved 2013</p>	<p>Systems modeling of the metabolic network of a gut microbial community</p> <p>Principal investigator Dr. Julien Limenitakis University of Bern</p> <p>Host research group Prof. Andrew Macpherson University of Bern</p> <p>Approved 2013</p>

Interdisciplinary PhD Projects (IPhD)

Systems-level study on the origin and variation of lag times in *E. coli*

Principal investigator
Dr. Markus Basan
ETH Zurich

Host research group
Prof. Uwe Sauer
ETH Zurich

Approved 2013

The influence of pH signaling on the regulation of brain energy metabolism

Principal investigator
Dr. Guillaume Azarias
University of Zurich

Host research group
Prof. Bruno Weber
University of Zurich

Approved 2013

A systems biology approach to understanding the mode of action of new antibiotics against Gram-negative bacteria

PhD student
Alessandra Vitale
University of Zurich

Supervisors
Prof. John A. Robinson
Prof. Leo Erbel
University of Zurich

Approved 2015

A systems immunology guided strategy for immunogen engineering

PhD student
Fabian Sesterhenn
EPF Lausanne

Supervisors
Prof. Bruno Emanuel Ferreira De Sousa Correia
EPF Lausanne
Prof. Sai Reddy
ETH Zurich

Approved 2015

Baysian learning of quantal parameters at single synapse resolution

PhD student
tba

Supervisors
Prof. Martin Müller
University of Zurich
Prof. Jean-Pascal Pfister
University of Zurich and
ETH Zurich

Approved 2015

Understanding the genotype to phenotype transformation for cholesterol regulation using a network based approach

Principal investigator
Dr. Peter Blattmann
ETH Zurich

Host research group
Prof. Ruedi Aebersold
ETH Zurich

Approved 2013

Cortical tension and stiffness during asymmetric cell division

Principal investigator
Dr. Tri Thanh Pham
University of Basel

Host research group
Prof. Clemens Cabernard
University of Basel

Approved 2012

Deciphering a prototypical MAP kinase signaling network at the single cell level using a genetically-encodable optogenetic circuit

PhD student
tba

Supervisors
Prof. Olivier Pertz
University of Basel
Prof. Mustafa Khammash
ETH Zurich

Approved 2015

Decision-making: a multi-stage approach

PhD student
Leila Drissi Dahoudi
EPF Lausanne

Supervisors
Prof. Michael Herzog
Prof. Wulfram Gerstner
EPF Lausanne

Approved 2015

Evolutionary systems biology: robustness, cryptic genetic variation and innovation in transcription factor binding

PhD student
Illaria Sala
University of Zurich

Supervisors
Prof. Andreas Wagner
Dr. Yolanda Schärli Renggli
Dr. Joshua Payne
University of Zurich

Approved 2015

Metabolic regulations of human T cell activation and differentiation

Principal investigator
Dr. Roger Geiger
Università della Svizzera italiana

Host research group
Prof. Antonio Lanzavecchia
ETH Zurich

Approved 2012

Robustness of *C. elegans* development at thermal limits

Principal investigator
Dr. Aitana Neves da Silva
EPF Lausanne

Host research group
Prof. Pierre Gönczy
EPF Lausanne

Approved 2012

Modeling the neural circuit for sensorimotor transformations in *Drosophila*

PhD student
tba

Supervisors
Prof. Simon Sprecher
University of Fribourg
Prof. Walter Senn
University of Bern
Prof. Christian Mazza
University of Fribourg

Approved 2015

Molecular mechanisms of stochastic chromatin effector interaction dynamics

PhD student
tba

Supervisors
Prof. Beat Fierz
Prof. Vassily Hatzimanikatis
EPF Lausanne

Approved 2015

Nuclear organization of expanded trinucleotide repeats

PhD student
Gustavo Ruiz Buendia
University of Lausanne

Supervisors
Prof. Vincent Dion
University of Lausanne
Prof. Ioannis Xenarios
SIB Swiss Institute of Bioinformatics and University of Lausanne

Approved 2015

Systems analysis of the bistable transfer competence pathway of a prokaryotic integrative and conjugative element

PhD student
Xavier Richard
University of Lausanne

Supervisors
Prof. Jan Roelof van der Meer
University of Lausanne
Prof. Christian Mazza
University of Fribourg

Approved 2015

A computational framework for systems pathology of prostate cancer

PhD student
Malamati Koletou
University of Zurich

Supervisors
Prof. Peter Wild
University Hospital Zurich
Dr. Maria Rodriguez Martinez
IBM Research – Zurich

Approved 2014

Comprehensive analysis of transcription factor – promoter interaction in vitro and in vivo

PhD student
tba

Supervisors
Prof. Sebastian Maerkl
EPF Lausanne
Prof. David Shore
University of Geneva

Approved 2014

Computational modeling of pluripotent stem cell transcription factor networks

PhD student
Oliver Hilsenbeck
ETH Zurich

Supervisors
Prof. Timm Schroeder
Prof. Jörg Stelling
ETH Zurich

Approved 2014

Establishment of in vivo verified molecular networks that control T cell function in chronic infection

PhD student
Patrick Roelli
University of Lausanne

Supervisors
Prof. Dietmar Zehn
University Hospital Lausanne
Dr. Mauro Delorenzi
SIB Swiss Institute of Bioinformatics

Approved 2014

Functional organization of the plant nucleus

PhD student
Mariamawit Ashenafi
University of Zurich

Supervisors
Dr. Célia Baroux
Prof. Ueli Grossniklaus
University of Zurich
Dr. Peter Majer
Bitplane AG

Approved 2014

<p>Input-output relationships underlying transcriptional bursting at the genome-wide level</p> <p>PhD student Onur Tidin EPF Lausanne</p> <p>Supervisors Prof. David Suter Prof. Felix Naef EPF Lausanne</p> <p>Approved 2014</p>	<p>Integrating genomic and physiological data to unravel the functioning of key hub nodes in mammalian regulatory networks: the case of the peroxisome proliferator-activated receptor γ co-activator 1α (PGC-1α)</p> <p>PhD student Anne Krämer University of Basel</p> <p>Supervisors Prof. Christoph Handschin Prof. Erik van Nimwegen University of Basel</p> <p>Approved 2014</p>	<p>Metabolic network governing <i>Toxoplasma gondii</i> persistence and transmission</p> <p>PhD student Aarti Krishnan University of Geneva</p> <p>Supervisors Prof. Dominique Soldati-Favre University of Geneva Prof. Vassily Hatzimanikatis EPF Lausanne Prof. Adrian Hehl University of Zurich</p> <p>Approved 2014</p>	<p>Micro2X: micropatterning of microbial communities – tailoring cooperation versus competition</p> <p>PhD student Maximilian Mittelviehhaus ETH Zurich</p> <p>Supervisors Prof. Julia Vorholt Dr. Tomaso Zambelli ETH Zurich</p> <p>Approved 2014</p>	<p>Model based inference of age related changes in circadian oscillators</p> <p>PhD student Sara Fonseca University of Fribourg</p> <p>Supervisors Prof. Daniel Wegmann Dr. Jürgen Ripperger University of Fribourg</p> <p>Approved 2014</p>
<p>Prediction error processing in neural networks of the mammalian brain</p> <p>PhD student Maria Chernysheva University of Zurich</p> <p>Supervisors Prof. Fritjof Helmchen University of Zurich Prof. Klaas Enno Stephan ETH Zurich and University of Zurich</p> <p>Approved 2014</p>	<p>Quantification of growth-controlled gene transcription dynamics by live, single-cell imaging</p> <p>PhD student Victoria Wosika University of Lausanne</p> <p>Supervisors Prof. Serge Pelet University of Lausanne Prof. David Shore University of Geneva</p> <p>Approved 2014</p>	<p>Spectral deconvolution of SWATH data for peptide identification and deciphering HIV-1 antiviral response mechanisms</p> <p>PhD student Aivett Bilbao University of Geneva</p> <p>Supervisors Dr. Frédérique Lisacek SIB Swiss Institute of Bioinformatics Prof. Gérard Hopfgartner University of Geneva</p> <p>Approved 2014</p>	<p>Systematic characterization of the cell biological and mechanical properties of asymmetrically dividing <i>Drosophila</i> neuroblasts</p> <p>PhD student Arnaud Monnard University of Basel</p> <p>Supervisors Prof. Clemens Cabernard University of Basel Prof. Daniel Jobst Müller ETH Zurich</p> <p>Approved 2014</p>	<p>Systems analysis of the impact of IFN-lambda signaling on vaccine response</p> <p>PhD student Jana Esther Linnik ETH Zurich</p> <p>Supervisors Prof. Jörg Stelling ETH Zurich Dr. Adrian Egli University of Basel</p> <p>Approved 2014</p>
<p>Systems biology of vision: online identification of visual coding properties of retinal ganglion cells</p> <p>PhD student Roland Diggelmann ETH Zurich</p> <p>Supervisors Prof. Andreas Hierlemann ETH Zurich Dr. Botond Roska Friedrich Miescher Institute for Biomedical Research</p> <p>Approved 2014</p>	<p>Towards in silico organogenesis: inferring and simulating regulatory network dynamics on growing embryonic 3D limb bud domains</p> <p>PhD student Diana Barac ETH Zurich</p> <p>Supervisors Prof. Dagmar Iber ETH Zurich Prof. Rolf Zeller University of Basel</p> <p>Approved 2014</p>	<p>A massively parallel space-time connected approach based on implicit active contour methods to track leukocytes observed by multiphoton intra vital and confocal microscopy</p> <p>PhD student Diego Ulisse Pizzagalli Università della Svizzera italiana</p> <p>Supervisors Dr. Santiago Fernandez Gonzalez Prof. Rolf Krause Prof. Marcus Thelen Prof. Michael Bronstein Università della Svizzera italiana</p> <p>Approved 2013</p>	<p>Cause and necessity of metabolic adaptation in human epidermis</p> <p>PhD student Andreas Kühne ETH Zurich</p> <p>Supervisors Dr. Nicola Zamboni Prof. Manfred Claassen ETH Zurich</p> <p>Approved 2013</p>	<p>Dynamic single-cell analysis through microfluidics-enabled impedance spectroscopy and fluorescence microscopy</p> <p>PhD student Ketki Chawla ETH Zurich</p> <p>Supervisors Prof. Andreas Hierlemann Prof. Jörg Stelling ETH Zurich</p> <p>Approved 2013</p>
<p>Exploring response surfaces and synergistic interactions of antibiotic combination treatment for <i>Neisseria gonorrhoeae</i></p> <p>PhD student Sunniva Förster University of Bern</p> <p>Supervisors Dr. Christian Althaus Dr. Lucy Hathaway Prof. Nicola Low University of Bern</p> <p>Approved 2013</p>	<p>High-throughput microfluidic single cell analysis platform for deciphering heterogeneity in stress-responsive signalling</p> <p>PhD student Ranjan Mishra ETH Zurich</p> <p>Supervisors Prof. Matthias Peter Prof. Andrew deMello ETH Zurich</p> <p>Approved 2013</p>	<p>Integrating transcriptional and allosteric regulation in central metabolism of <i>E. coli</i></p> <p>PhD student Dimitris Christodoulou ETH Zurich</p> <p>Supervisors Prof. Uwe Sauer Prof. Jörg Stelling ETH Zurich</p> <p>Approved 2013</p>	<p>Numerical models of reaction-diffusion/chemotaxis determining complex patterns of skin appendages and skin coloration: incorporating 3D, growth, and realistic networks of activators/inhibitors</p> <p>PhD student Antonio Martins University of Geneva</p> <p>Supervisors Prof. Michel Milinkovitch Prof. Bastien Chopard University of Geneva</p> <p>Approved 2013</p>	<p>QuantX – quantification of amino acid transporter interaction through system identification</p> <p>PhD student Mehdi Taslimifar University of Zurich</p> <p>Supervisors Prof. Vartan Kurtcuoglu Prof. François Verrey University of Zurich</p> <p>Approved 2013</p>
<p>Systems analysis of a morphogen response</p> <p>PhD student Alexandra Franz University of Zurich</p> <p>Supervisors Prof. Konrad Basler Prof. Christian von Mering University of Zurich</p> <p>Approved 2013</p>	<p>A microfluidics-based pipeline for the quantitative analysis of yeast aging</p> <p>PhD student Marek Konrad Krzyzanowski ETH Zurich</p> <p>Supervisors Prof. Yves Barral Prof. Andrew deMello ETH Zurich</p> <p>Approved 2012</p>	<p>An extended computational morphodynamics approach to understand self-organization in plant growth control</p> <p>PhD student Alice Sarah Breda University of Lausanne</p> <p>Supervisors Prof. Christian Hardtke University of Lausanne Prof. Richard Smith MPI Cologne</p> <p>Approved 2012</p>	<p>Collective dynamics and crosstalk in MAPK signaling</p> <p>PhD student Sunil Kumar ETH Zurich</p> <p>Supervisors Prof. Heinz Koepl Technical University of Darmstadt Prof. Matthias Peter ETH Zurich</p> <p>Approved 2012</p>	<p>Dynamics of Sertoli cell transcriptomes during the progression of spermatogenesis using ultrahigh-throughput sequencing technologies</p> <p>PhD student Isabelle Stévant University of Geneva</p> <p>Supervisors Prof. Serge Nef Prof. Emmanouil Dermitzakis University of Geneva</p> <p>Approved 2012</p>

Special Opportunities Projects

<p>Generation of biomarkers for the detection of ADP-ribosylated proteins during cellular stress</p> <p>PhD student Vera Bilan University of Zurich</p> <p>Supervisors Prof. Michael Hottiger University of Zurich Prof. Gérard Hopfgartner University of Geneva</p> <p>Approved 2012</p>	<p>Genomic and transcriptomic characterization of heterogeneous tumor cell populations</p> <p>PhD student Ariane Hofmann ETH Zurich</p> <p>Supervisors Prof. Niko Beerenwinkel Dr. Christian Beisel ETH Zurich Prof. Holger Moch University Hospital Zurich</p> <p>Approved 2012</p>	<p>A new technology for affinity proteomics in systems biology</p> <p>Principal investigator Prof. Andreas Plückthun University of Zurich</p> <p>Approved 2015</p>	<p>An integrative microfluidic platform for rapid and parallel gene expression and chromatin landscape profiling in few (<100) to single cells</p> <p>Principal investigator Prof. Bart Deplancke EPF Lausanne</p> <p>Approved 2015</p>	<p>Associating HDL synapse nano-organisation with clinical HDL particle signaling capacity</p> <p>Principal investigators Prof. Bernd Wollscheid Prof. Manfred Claassen ETH Zurich</p> <p>Approved 2015</p>
<p>Modeling dynamics of protein synthesis and degradation in Arabidopsis thaliana</p> <p>PhD student Phillip Ihmor ETH Zurich</p> <p>Supervisors Dr. Katja Bärenfaller ETH Zurich Prof. Mark Robinson University of Zurich</p> <p>Approved 2012</p>	<p>Modeling the cellular phosphorylation response to double strand breaks using quantitative mass spectrometry</p> <p>PhD student Ariel Bensimon ETH Zurich</p> <p>Supervisors Prof. Ruedi Aebersold Prof. Niko Beerenwinkel ETH Zurich</p> <p>Approved 2012</p>	<p>Bidirectional, tunable and spatio-temporally controlled multigene regulation using CRISPR-sgRNA-arrays</p> <p>Principal investigator Prof. Konrad Basler University of Zurich</p> <p>Approved 2015</p>	<p>Development of a high-throughput platform for systems immunology and protein engineering</p> <p>Principal investigator Prof. Sebastian Maerkl EPF Lausanne</p> <p>Approved 2015</p>	<p>High-throughput single yeast cell secretion analysis in nL droplets</p> <p>Principal investigators Prof. Petra S. Dittrich ETH Zurich Prof. Lars Blank RWTH Aachen</p> <p>Approved 2015</p>
<p>Quantitative approaches for the reconstruction of palmitoylation networks in ER</p> <p>PhD student Tiziano Dallavilla EPF Lausanne</p> <p>Supervisors Prof. Vassily Hatzimanikatis Prof. Gisou van der Goot EPF Lausanne</p> <p>Approved 2012</p>	<p>Systems analysis of neutralizing antibody repertoires for nanoparticulate-based anti-viral vaccine design</p> <p>PhD student Marcela Rincon-Restrepo EPF Lausanne</p> <p>Supervisors Prof. Melody Swartz EPF Lausanne Prof. Sai T. Reddy ETH Zurich</p> <p>Approved 2012</p>	<p>In vivo group II intron folding and self-splicing on the single molecule level</p> <p>Principal investigator Prof. Roland Sigel University of Zurich</p> <p>Approved 2015</p>	<p>Protein-LEGO: a high-throughput approach to dissecting protein-genome interactions by quantifying the contribution of individual protein domains</p> <p>Principal investigator Prof. Tuncay Baubec University of Zurich and Friedrich Miescher Institute for Biomedical Research</p> <p>Approved 2015</p>	<p>SynucleinX: a platform for systems biology of Parkinson's disease</p> <p>Principal investigators Prof. Dr. med. Adriano Aguzzi Dr. Simone Hornemann University Hospital Zurich University of Zurich</p> <p>Approved 2015</p>
<p>Towards systems biology of adenovirus transmission</p> <p>PhD student Artur Yakimovich University of Zurich</p> <p>Supervisors Prof. Urs Greber University of Zurich Prof. Ivo F. Sbalzarini Max Planck Institute of Molecular Cell Biology and Genetics, Dresden</p> <p>Approved 2012</p>	<p>Lunaphore: Development of a microfluidic tissue processor for high-throughput and multiplexed molecular profiling of tumors</p> <p>Principal investigator Dr. Ata Tuna Ciftlik EPF Lausanne</p> <p>Approved 2013</p>	<p>SIB fellowship program: SIB PhD-fellowships</p> <p>Principal investigator Prof. Ron Appel SIB Swiss Institute of Bioinformatics</p> <p>Approved 2012</p>	<p>Entrepreneur in residence (EIR): Innovation scouting service</p> <p>Principal investigator Michael Dillhyon Dillhyon Ventures</p> <p>Approved 2012</p>	<p>Micronaut: Recording high resolution stereo-SEM images</p> <p>Principal investigator Prof. Henning Stahlberg University of Basel</p> <p>Approved 2012</p>
			<p>SwissLipids: Dedicated knowledge base for comprehensive curated information on lipids</p> <p>Principal investigator Dr. Alan Bridge SIB Swiss Institute of Bioinformatics</p> <p>Approved 2012 / 2014</p>	<p>Visible networks – research politics and life sciences in the 21st century: PhD project in history of technology</p> <p>Principal investigator Prof. David Gugerli ETH Zurich</p> <p>Approved 2011</p>

Partner institutions of SystemsX.ch



Zürcher Hochschule
für Angewandte Wissenschaften



Contact information

Dr. Daniel Vonder Mühl
Managing Director
SystemsX.ch
Clausiusstrasse 45
CH-8092 Zurich
Phone: +41 (0)44 632 78 88
daniel.vondermuehl@systemsx.ch

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www.systemsx.ch

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communications@systemsx.ch

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