

19-20 November 2018  
Hotel Doldenhorn, Kandersteg

# Quantitative network biology: from physical models to artificial intelligence

Physical models and emerging properties  
AI/Machine learning in biology  
Systems biomedicine

Joint  
symposium:  
LS<sup>2</sup> &  
SystemsX.ch

**Meeting Booklet**

**This meeting booklet belongs to:**

**Please find space for your notes at the end of this booklet**



**SystemsX.ch**  
The Swiss Initiative in Systems Biology



**International Plenary Speakers**  
Anna Akhmanova (NL)  
Leonie Ringrose (DE)  
Anne Bertolotti (UK)  
Jody Rosenblatt (US)

**Free Public Panel Discussion**  
"Is merit (gender) biased?  
Advancement in academia."  
Free registration with an e-mail to [info@ls2.ch](mailto:info@ls2.ch).

**Lunch Career Session**  
...for young scientists

**Industry Exhibition**  
...with big lottery

**Scientific Symposia**  
The Proteome in 3D  
Live Cell Imaging Approaches in Cell Biology  
Regeneration & Pathology of Skeletal Muscle  
Bacterial Cell Biology  
Chromatin, Epigenetics & Transmission  
of Acquired States across Generation  
Chemical Biology & Drug Development  
Novel Insights & Therapeutic Options  
offered by Glycosciences

**Pls of Tomorrow Contest**  
...presenting the finalists

**Two Poster Sessions**  
...with five poster prizes

**Award Lectures**  
Friedrich-Miescher Award  
Lelio Orci Award



**Will you be there?**  
[www.annual-meeting.ls2.ch](http://www.annual-meeting.ls2.ch)

Abstract submission extended until **9 December 2018**  
General registration until **13 January 2019**

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# Program Overview

## Monday, 19 November 2018

- 12:30-12:40      **Welcome:**  
**Vassily Hatzimanikatis (EPF Lausanne) and**  
**Carolin von Schoultz (LS<sup>2</sup>)**
- 12:40-16:15**      **Session I: Physical Models and Emergent Properties**
- 12:40-13:15      **Beat Fierz**  
(EPF Lausanne)  
*"Probing dynamic chromatin organization on the single-molecule scale"*
- 13:15-13:50      **Attila Becskei**  
(University of Basel)  
*"The control of stochastic gene choice during neuronal differentiation"*
- 13:50 -14:00      **Poster presentation 1:**  
**Jan Burri (ETH Zurich)**  
*"How pollen tubes perceive and overcome obstacles"*
- 14:00-14:30      **Coffee break**
- 14:30-14:40      **Poster presentation 2:**  
**Aarti Krishnan (University of Geneva)**  
*"Metabolic modeling of Toxoplasma gondii: toward stage-specific networks"*
- 14:40-15:15      **Niko Beerenwinkel**  
(ETH Zurich)  
*"Learning tumor phylogenies from single-cell data"*
- 15:15-15:50      **Michel Milinkovitch**  
(University of Geneva)  
*"Patterning of the vertebrate skin through mechanical and Turing instabilities"*
- 15:50-16:15      **Poster flashlight presentations**  
Coralie Dessauges (University of Bern)  
V́ctor Garća (ZHAW)  
Marc-Antoine Jacques (University of Bern)  
Anush Chiappino Pepe (EPF Lausanne)  
Maciej Dobrzynski (University of Bern)

Fangfei Zhang (ETH Zurich)  
James Wade (Georgia Inst. of Technol. and Emory University)  
Daniel Robert Weilandt (EPF Lausanne)  
Florien Gorter (ETH Zurich)  
Paolo Gagliardi (University of Bern)  
María Masid Barcon (EPF Lausanne)  
Peter Ashcroft (ETH Zurich)  
Homa Mohammadi Peyhani (EPF Lausanne)

16:15-16:45

**Coffee break**

**16:45-17:45**

**Keynote Lecture:**

**Johan Elf**  
(University of Uppsala, Sweden)

17:45-19:00

**Break**

19:00-21:30

**Dinner**

21:30-23:00

**Poster session and drinks**

## **Tuesday, 20 November 2018**

### **09:00-12:00**      **Session II: AI/Machine Learning**

- 09:00-09:35      **Manfred Claassen**  
(ETH Zurich)  
*"(Un-)supervised learning of cell population structure from single-cell snapshot data"*
- 09:35-10:10      **Enkelejda Miho**  
(FHNW MuttENZ)  
*"Artificial intelligence uncovers signatures of antibodies"*
- 10:10-10:20      **Poster presentation 3:**  
**Marc-Antoine Jacques** (University of Bern)  
*"Machine learning-based mining of ERK and AKT biosensor time-series reveals new signatures of oncogenic signaling"*
- 10:20-10:50      **Coffee break**
- 10:50-11:00      **Poster presentation 4:**  
**Bruno Correia** (EPF Lausanne)  
*"Molecular deep learning on protein surfaces for functional prediction and de novo design"*
- 11:00-11:35      **María Rodríguez-Martínez**  
(IBM Research, Zurich)  
*"Characterizing tumor heterogeneity with single cell proteomics"*
- 11:35-12:10      **Michael Stadler**  
(FMI Basel)  
*"Mammalian chromatin remodelers selectively mediate transcription factor binding"*
- 12:10-13:15      **Lunch**
- 13:15-16:45**      **Session III: Systems Biomedicine**
- 13:15-13:50      **Paola Picotti**  
(ETH Zurich)  
*"Probing protein structural changes on a proteome-wide scale"*

- 13:50-14:25      **Patrick Matthias**  
(FMI Basel)  
*"Towards a mechanistic and quantitative framework for virus uncoating"*
- 14:25-14:35      **Poster presentation 5:**  
**Vito Zanutelli** (University of Zurich)  
*"Investigating microenvironment-to-cell signaling in 3D spheroids through imaging mass cytometry"*
- 14:35-15:05      **Coffee break**
- 15:05-15:15      **Poster presentation 6:**  
**Andreas Moor**  
(University of Zurich and Weizmann Institute of Science)  
*"Spatial reconstruction of single enterocytes uncovers broad zonation along the intestinal villus axis"*
- 15:15-15:50      **Uwe Sauer**  
(ETH Zurich)  
*"Metabolic coordination through metabolite-protein interactions"*
- 15:50-16:25      **Bart Deplancke**  
(EPF Lausanne)  
*"The genetic and molecular determinants of circadian variation in *Drosophila melanogaster*"*
- 16:25-16:45      **Closing remarks:**  
**Vassily Hatzimanikatis** (EPF Lausanne) and  
**Attila Becskei** (University of Basel)

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# THE HUMAN BODY

THE ULTIMATE FRONTIER OF COMPLEXITY

**The documentary film about SystemsX.ch** reveals what it takes to understand the human system from a biological point of view. Since 2007, the Swiss research initiative in systems biology has supported around 250 interdisciplinary research projects at the interface between biology, physics, chemistry, mathematics and medicine as well as engineering and computer science. The documentary, titled “The human body: the ultimate frontier of complexity“, explains how these projects are helping decipher the mechanisms of the human body, and how systems biology is opening up new possibilities in the study, diagnosis and development of (personalized) therapies to treat serious illnesses or age-related disorders.



Watch the film at  
[www.systemsx.ch/film](http://www.systemsx.ch/film)



**SystemsX.ch**  
The Swiss Initiative in Systems Biology

## Organizers

### The executive committee of the LS<sup>2</sup> section Systems Biology

- Vassily Hatzimanikatis, President (EPF Lausanne)
- Attila Becksei, Vice president (Biozentrum, University of Basel)
- Eavan Dorcey (Board member, SystemsX.ch)



SystemsX.ch  
The Swiss Initiative in Systems Biology

<https://www.ls2.ch/sections/systems-biology>

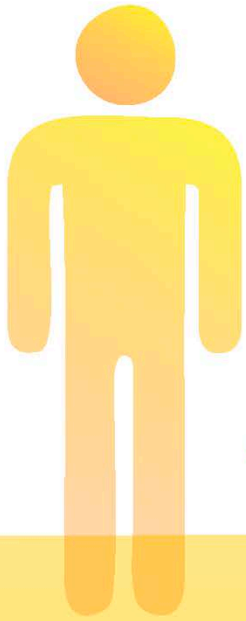
### Life Sciences Switzerland (LS<sup>2</sup>)

- Carolin von Schoultz (Scientific Officer)
- Jacqueline Oberholzer (Executive Secretary)
- Elena Cardenal-Munoz (Social Media Manager)
- Dagmar Bocakova (design, [bocakova@gmail.com](mailto:bocakova@gmail.com))
- Dominique Ritter (administration)
- Michael Vögeli (IT)

# Thank you all for your participation!

Feedback to:  
[info@ls2.ch](mailto:info@ls2.ch)





# Is merit (gender) biased?

## Advancement in Academia.

A free public panel discussion as part of the LS<sup>2</sup> Annual Meeting 2019

How do (gender) biases influence the evaluation and selection of scientists?

How can we address (gender) biases and reduce their influence on selection processes?

**Gerlind Wallon** will summarize the current status of the representation of women in academia.

**Marieke van den Brink** will report on her studies that reveal how recruitment in academia is influenced by (gender) biases.

**Britt Dahmen** will present how the cascading model, a quota system required by law, is implemented at Cologne University.

**Chair:**  
**Dr. Gerlind Wallon**  
EMBO Deputy Director & Program Manager



Attendance to the panel-only is free.

Please register for the panel until January, 5th, 2019 with an e-mail to [info@ls2.ch](mailto:info@ls2.ch).

Full meeting attendance requires registration via [www.annual-meeting.ls2.ch/registration](http://www.annual-meeting.ls2.ch/registration).

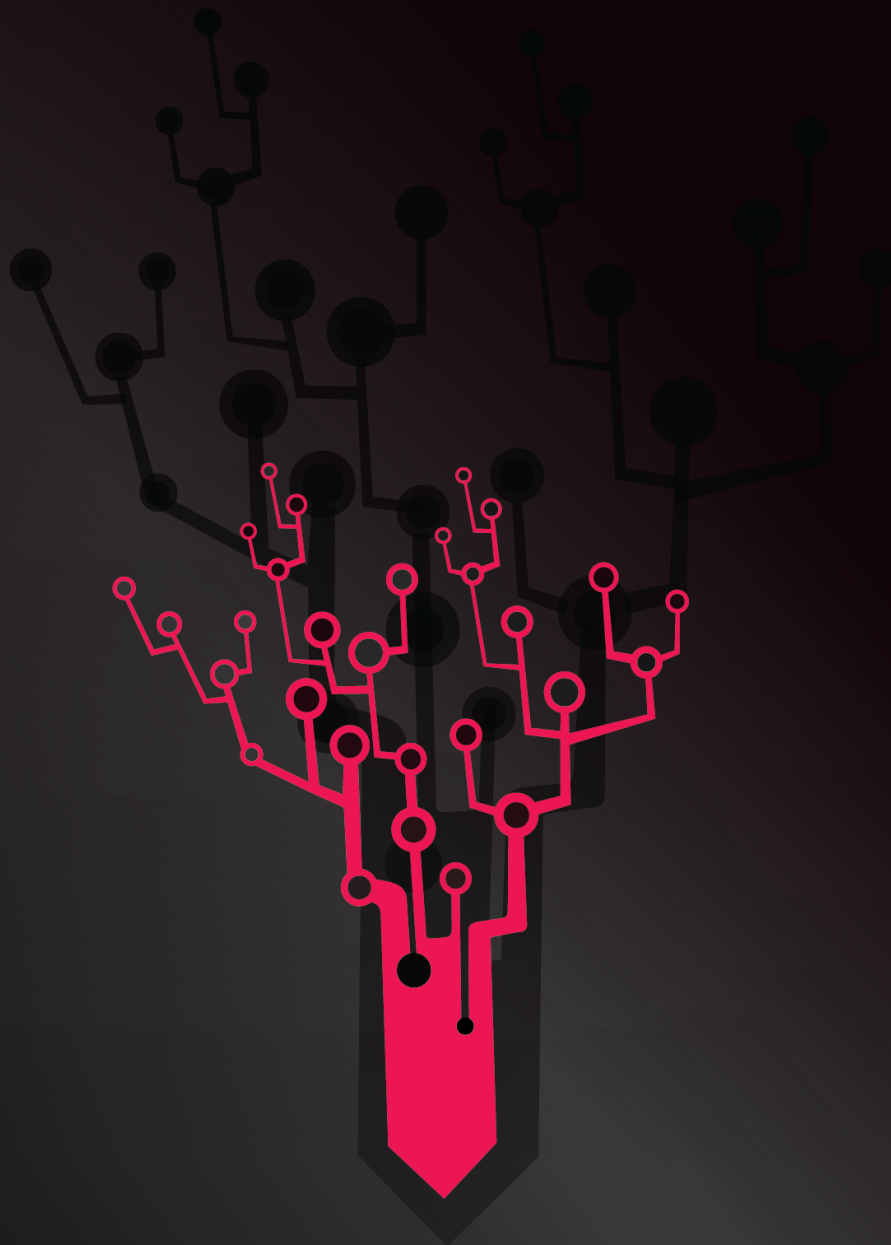
### Invited speakers:

**Prof. Dr. Marieke van den Brink**  
*Professor Gender & Diversity*  
Radboud University, Nijmegen (NL)

&

**Dr. Britt Dahmen**  
*Head of Department for Gender Equality & Diversity*  
University of Cologne (DE)





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