

# Theory across Biology – Program, 27.1.2023

Unitobler F021, Lerchenweg 36, Bern

## Program

- 9:30 - 10:00 Registration and welcome coffee  
10:00 - 10:05 Introductory notes by the Organizers
- 10:05 - 11:05 Prof. Uri Alon, Weizmann Institute of Science**  
*Inflammation and fibrosis: from circuit to target*
- 11:05 - 11:50 Prof. Dagmar Iber, ETH D-BSSE**  
*tba*
- 11:50 - 13:50 lunch and open white board / poster session
- 13:50 - 14:20 Bernadette Stolz, EPFL/University of Oxford**  
*Shape at multiple scales in biological data - a topological perspective*
- 14:20 - 15:05 Prof. Claudia Bank, University of Bern**  
*Rapid adaptation of recombining populations on tunable fitness landscapes*
- 15:05 - 15:35 Adam Gosztolai, EPFL Lausanne**  
*Manifold-constrained dynamics: a geometric lens to understand computations in biological and artificial neural systems*
- 15:35 - 16:00 coffee break
- 16:00 - 16:45 Prof. Vassily Hatzimanikatis, EPFL Lausanne**  
*tba*
- 16:45 - 17:30 Dr. Sonja Lehtinen, ETHZ**  
*antibiotic apocalypse now?*

## Sponsors



## Open whiteboard session

Foyer Lerchenweg 35, 11:50-13:50

### 1. A statistical framework for optimized multiplexed imaging experimental design and data analysis

Pierre Bost (a), Ruben Casanova (a), Uria Mor (b), Bernd Bodenmiller (a); a. ETH/University of Zürich, b. Weizmann Institute/Tel-Aviv University.

### 2. A framework for microbial growth in nutrient colimitation

Noelle Held (a,b,c), Justus Fink (a), Michael Manhart (d)a. Department of Environmental Systems Science, ETH Zurich, b. Department of Environmental Microbiology, Eawag, c. Department of Biological Sciences, University of Southern California, d. Center for Advanced Biotechnology and Medicine, Rutgers University

### 3. Modeling apoptotic signaling waves in epithelia with cellular automata

Paolo Armando Gagliardi (a), Maciej Dobrzyński (a), Olivier Pertz (a); a. Institute of Cell Biology, University of Bern, Baltzerstrasse 4, 3012 Bern, Switzerland

### 4. Dissecting the interplay between a linear and a cyclic timer

Lucas J Morales Moya (a), Jana Brunner (a), Dimosthenis Gaidatzis (a), Helge Grosshans (a); a. Friedrich Miescher Institute for Biomedical Research

### 5. On the role of deleterious mutant regime in steering long term evolution

Nikhil Sharma (a), Joachim Krug (b), Arne Traulsen (a); a. Max Planck Institute for Evolutionary biology, Germany, b. Institute for Biological Physics, University of Cologne, Germany.

### 6. Deciphering mechanisms of symmetry breaking in *C. elegans* embryos

Ella Müller (a), Pierre Gönczy (a). a. Ecole Polytechnique Fédérale de Lausanne.

### 7. Learning accelerates the evolution of slower aging, but constrains the evolution of negligible senescence

Peter Lenart (a), Sacha Psalmon (a, b), Benjamin Towbin (a), a. University of Bern, Institute of Cell Biology, Bern, Switzerland, b. Polytech Nice Sophia, Côte d'Azur University, Nice, France

### 8. Optimization Versus Modeling in Biology

Marco Guazzini (a), Alexander Reisach (b), Sebastian Weichwald (c), and Christof Seiler (a); a. Maastricht University, b. Université Paris Cité, c. University of Copenhagen

### 9. Symmetry breaking and number control at the onset of centriole assembly

Friso Douma (a), Pierre Gönczy (a); a. Swiss Federal Institute of Technology (EPFL) Lausanne

### 10. Detection and quantification tool for emergent collective signalling phenomena

Paolo Armando Gagliardi (a), Benjamin Grädel (a), Marc-Antoine Jacques (a), Lucien Hinderling (a), Pascal Ender (a), Andrew Cohen (b), Gerald Kastberger (c), Olivier Pertz (a) Maciej Dobrzyński (a); a. Institute of Cell Biology, University of Bern, b. Department of Electrical and Computer Engineering, Drexel University, c. Institute for Biology, Karl-Franzens-University Graz

### 11. spillR: A Causal Method for Spillover Compensation in Mass Cytometry

Marco Guazzini (Maastricht University), Alexander Reisach (University of Paris Diderot), Sebastian Weichwald (University of Copenhagen), and Christof Seiler (Maastricht University)