

Swiss Systems Biology Symposium (SBSS) 2025

UniS, Schanzeneckstrasse 1, Bern

Program - 19.06.2025

09:00 Registration and welcome coffee

09:25 **Welcome from chairs**

Benjamin Towbin (University of Bern)

Charisios Tsiairis (FMI)

09:30 **Prof. Leeat Keren - Systems tissue pathology**

"Love thy neighbour – unravelling the tumour microenvironment with spatial proteomics"

10:40 **Parallel Sessions I: Focal areas in systems biology**

Gene expression, Development, Personalized medicine,
Synthetic biology, Microbial systems

12:20 Lunch and poster session

13:50 **Parallel Sessions II: Methodologies in systems biology**

Big data, single cell technologies, Theory and modelling, Imaging, new model organisms

15:55 Coffee break

16:25 **Prof. Edouard Hannezo - Physical Principles in Biological Systems**

"Robustness of morphogenesis via mechanical feedbacks"

A central question in biology is how genetic information is integrated across many length scales to shape and pattern cells, organs and organisms. Theoretical biophysics have proven instrumental in proposing minimal conceptual frameworks to understand the self-organizing potential of living matter, as well as to identify key predictions that can be verified experimentally. However, a key feature of multicellular development is not simply the emergence of increasing complex shapes and form, but the fact that this process is robust and reproducible. In this talk, I will present two recent works from our group on understanding how checkpoints for robustness can emerge from simple mechanical principles. Firstly, in the context of intestinal organoid morphogenesis, we show how mechano-sensitive feedbacks can give rise to mechanical bistability, rendering morphogenesis robust to subsequent mechanical perturbations once it's completed. Secondly, in the context of early mammalian embryogenesis, we show how mechanical compaction can buffer developmental variability and allow embryos to converge towards

17:25 Farewell drinks

17:55 End of the meeting