

# ITM0, SBCF, SFBD meeting

## Developmental and Cell Biology of the future

27th March, Wednesday

13:00 - 13h30 Registration of participants  
13:45 – 14:00 Welcome and housekeeping notes by the organizer

### 14:00 – 15:30 Environmental Impact on Development and Evolution

*Concept: Environment was accepted as of importance in evolution by pressuring individuals and thus allowing only the fittest to reproduce, transmit their genes and ensure species survival. Then it was its impact on stress response and transcriptional regulation, that could severely impaired embryos formation if happening during key steps of development. Nowadays, with the advances in epigenetics, environment is back in the game of genes transmission. Indeed, even if the genome sequence is unchanged, an individual submitted to environmental stress could transmit stress mark to the next generation and thus modify phenotype.*

*Environment is not only selecting individuals but also shaping them and marking them for several generations. In natural selection process survival of the offspring is a key step and in a fast changing environment (global warming, ocean acidification, pollution...) it is of interest to predict if and how species will bypass this challenge, at what cost and how next generations are going to be impacted.*

*This session will cover parental transmission of environmental marks, impact of environment on embryonic development and offspring dispersal.*

14:00 – 14:30 Markus Bleich (Germany) (25min + 5min questions)  
14:30 – 15:30 3 talks by selected participants (each 12min + 3min questions)

15:30 – 16:00 Coffee break

### 16:00 – 17:30 Single Cell Omics: a revolution for development and evolution

*Concept: There has been an explosion of new information in recent years that bear on the issue of specific features of development and evolution. These breakthroughs are multidisciplinary and come from the fields of developmental biology, genetics, and molecular biology. With this burst of new information comes the opportunity to sketch a new landscape and integrate developmental and evolutionary findings into an updated framework. The expansion of new technologies including single-cell “omics” represents an unprecedented tool to analyze the complexities of biological systems. Single-cell high-throughput technologies come with different flavors including genomics, transcriptomics, epigenomics, proteomics and imaging. The next step is to combine these technologies for multi-dimensional analyses of individual cells, which will provide even more detailed and important insights into our understanding of development. This session of the meeting aims to bring together scientists with a common interest in understanding specific features of development and evolution by using single-cell omics.*

16:00 – 16:30 Fredrik Lanner (25min + 5min questions)  
16:30 – 17:30 3 talks by selected participants (each 12min + 3min questions)

17:30 – 18:30 **“Future of Developmental Biology”:** Carl-Philipp Heisenberg  
18:30 – 21:00 Dinner (if it is a buffet) and Poster session 1 - Mixer

## 28th March, Thursday

### 9:00 – 10:30 **Epigenomics and Genome Expression- a powerful regulator of development**

*Concept: Genome organization governs gene expression in space and time. Epigenome perturbations induce developmental impairment and pathological disorders such as cancer. This session will cover multiple aspects of the epigenetic field:*

- Crosstalk between epigenomic and gene expression: Role in developmental and cell biology.
- New players involved in chromosomal architecture and its role in developmental and cell biology.
- Clinical applications of recent discoveries in epigenomics

9:00 – 9:30 Giacomo Cavalli (25min + 5min questions)

9:30 – 10:30 3 talks by selected participants (each 12min + 3min questions)

10:30 – 11:00 Coffee break

### 11:00 – 12:30 **Stem cell biology and organoids**

*Concept: The basic aspects of stem cell biology have been largely deciphered using animal models and this is in expansion. However, researchers have found some limitations in the use of animal models to study some aspects of human development and diseases. Therefore, it is emerging the use of organoids to solve these limitations. This session will cover fundamental and applied research of stem cells through three issues:*

- Advances in stem cell biology: characterization of tissue-specific stem cells
- Developing and improving organoids
- Stem cell-based therapies: pros and cons (technical limitations, ethical and legal challenges, risks)

11:00 – 11:30 Henrik Jönsson (25min + 5min questions)

11:30 – 12:30 3 talks by selected participants (each 12min + 3min questions)

12:30 - 13:30 Lunch (if it is a buffet) + Poster Session 2

### 13:30 – 15:00 **Live-imaging and Image Processing**

*Concept: Uncovering the dynamics of morphogenesis and obtaining an understanding of development on the cellular and tissue-scale level is a major aim of developmental biology. During the last decades, advancements in microscopy techniques and culture conditions have allowed for the live-imaging of multiple developmental processes in an unprecedented detail. Live-imaging has shed light on the dynamics of morphogenesis on a variety of spatiotemporal scales: from fast subsecond dynamics at the single cell level, to morphogenetic changes on the organ level that take several hours or days of developmental time. This session will deal with highly transferable live imaging and analysis approaches, covering in-vitro and in-vivo systems.*

13:30 – 14:00 Daniela Matic Vignjevic (25min + 5min questions)

14:00 – 15:00 3 talks by selected participants (each 12min + 3min questions)

15:00 – 16:30 Coffee break

**16:30 – 18:00**                    **When mechanics meets cell biology**

*Chairs:???*

*Concept: In the recent years, it has been shown that biophysical cues can impact cell fates. Indeed, cells can sense and respond to biophysical cues of their surrounding environment, which can modulate key cell behaviors, such as migration, invasion, differentiation and survival. Thus mechanobiology lies at the interface of physics and cell biology. We propose to discuss recent advances in the understanding of cell-cell and cell-matrix communication through a mechanical and biophysical point of view.*

16:30 – 17:00                    Viola Vogel (25min + 5min questions)

17:00 – 18:00                    3 talks by selected participants (each 12min + 3min questions)

**18:00 – 19:00**                    **Keynote speaker 2- “Future of Cell biology”: Valerie Weaver**

19:00 – 19:15                    Prizes (& Closing Remarks?\*)

19:30 – 23:00                    Dinner + Social Activities

**29th March, Friday**

**9:00 – 12:00**   **Round table discussion: “The Future of Cell and Developmental Biology”**