Preliminary program

To ensure a maximal level of intermingling between researchers from different fields, we plan events related to all three areas (Build, Measure and Model) on each individual day. The final aim of the workshop is to write a short review paper that outlines new research directions based on combining these different research fields: the last day of the meeting is reserved for writing a first draft.

**Day 1/Nov 8**  Theme: it starts with a single cell

11:00-11:30  Welcome
11:30-12:00  **Alexander van Oudenaarden**
Ribosome profiling in single cells
12:00-12:30  **Sally Lowell**
Mis-shapes, Mistakes, Misfits: how do pluripotent cells make the right decisions?
12:30-13:30  Lunch break
13:30-14:00  **Susana Chuva de Sousa Lopes**
Single-cell technologies: the good, the bad and the ugly
14:00-14:30  **James Briscoe**
Quantifying the Waddington Landscape: dynamical models of cell fate decisions
14:30-15:00  break

Big question: What is a cell type?
15:00 - 15:45  Break-out discussions on sub-questions
16:00 - 16:45  Plenary discussion of break-out results
17:00-19:00  Online social activity

**Day 2/Nov 9**  Theme: let's get together - tissues

11:00-11:30  **Naomi Moris**
Modelling development in a dish: self-organisation in 3D gastruloids
11:30-12:00  **Stephan Grill**
Syncytium hydraulics
12:00-12:30  **Roeland Merks**
Cell-based models of single-cell behavior and collective cell behavior: Mechanobiology and the extracellular matrix.
12:30-13:30  Lunch break
13:30-14:00  **Matthias Lutolf**
Tissue geometry drives deterministic organoid patterning
14:00-14:30  **Ben Simons**
14:30-15:00 break

Big question: How does tissue-level organization emerge from single-cell dynamics?

15:00 - 15:45 Break-out discussions on sub-questions
16:00 - 16:45 Plenary discussion of break-out results

Day 3/Nov 10  Theme: getting organized - signals, gradients, forces

11:00-11:30 Alba Diz-Munos
Plasma membrane tethering controls cortex mechanics and architecture

11:30-12:00 Edouard Hannezo
Mechano-chemical models of active migration and organoid morphogenesis

12:00-12:30 Dagmar Iber
How precise is embryonic patterning?

12:30-13:30 Lunch break

13:30-14:00 Thomas Gregor
Transcription in four dimensions: how enhancers and promoters find each other

14:00-14:30 Celeste Nelson
Mechanical forces and epithelial morphogenesis

14:30-15:00 break

Big question: How are mechanical cues and chemical signaling integrated?

15:00 – 15:45 Break-out discussions on sub-questions
16:00 – 16:45 Plenary discussion of break-out results

Day 4/Nov 11  Theme: keeping time – dynamics of development

11:00-11:30 Kirsten ten Tusscher
Repetitive patterning in plants; model-driven discovery of a novel patterning mechanism

11:30-12:00 Gaspar Tkacik
The many bits of positional information

12:00-13:00 Lunch break

13:00-13:30 Aryeh Warmflash
Self-organizing stem cell systems to study early human development

13:30-14:00 Andrew Oates
A cell intrinsic timer drives the wave pattern of the segmentation clock

14:00-14:30  Jan Huisken
14:30-15:00  Break

Big question: How are developmental events timed robustly in the presence of stochastic dynamics at the single-cell level?

15:00 – 15:45  Break-out discussions on sub-questions
16:00 – 16:45  Plenary discussion of break-out results

Day 5/Nov 12  Theme: putting it all together

All day  Define and write up three new research directions that benefit from integrated approaches (in three groups)