Seminar/Talk

Time-lapse microscopy study of noise in development

Nicola Gritti
Postdoc Applicant

Host: Anna Kicheva

The development of multicellular organisms is an extremely complex and reliable process, in which single cells as well as entire tissues and organs must organize to give rise to an healthy adult capable of reproduction. Such a complex process is robust, meaning that mistakes hardly occur despite the presence of intrinsic molecular fluctuations in the underlying biology, which is often referred to as noise. However, the mechanisms that allow multicellular organisms to develop reliably despite biological noise are often poorly understood. In my talk, I give an overview of my PhD project, which aims to contribute to the understanding of the role of noise in the development of the nematode worm C. elegans.

Because of the intrinsic stochastic nature of developmental events, the best strategy to elucidate the underlying dynamics is to follow these processes over long periods of time. However, a technique which allows time-lapse microscopy of live animals over developmental time scales is currently lacking. In the first part of my talk, I introduce the technique we have developed in order to perform time-lapse microscopy at single cell resolution of single live C. elegans larvae over the full post-embryonic development. Next, I demonstrate the power of our technique, by analyzing for the first time the animal-to-animal variability in i) the temporal regulation of stem-cell like divisions and ii) the dynamics of oscillatory gene expression. Finally, I use our novel approach to elucidate the role of noise in the stochastic AC/VU cell fate decision. In this way, I show that the dynamical information captured by our approach provides new insights into the mechanisms controlling developmental processes.

Wednesday, March 15, 2017 01:30pm - 03:00pm
Seminar Room, Lab Building East

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.