Life Sciences Seminar

CANCELLED*CANCELLED*How the genome is reorganized during zygotic reprogramming to totipotencyCANCELLED*CANCELLED*

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Host: Simon Hippenmeyer

Totipotency, the potential of a cell to generate all cell types and a new organism, is achieved when egg and sperm fuse to form the one-cell zygote. How chromatin is epigenetically reprogrammed to totipotency within hours after fertilisation is a central question in biology. We aim to address this by investigating the mechanisms of reprogramming and spatial chromatin reorganisation in mammalian zygotes. The zygotic paternal genome is demethylated by a mechanism that was proposed to involve DNA breaks. We provide genetic evidence for a requirement of DNA repair in reprogramming and discovered that zygotic reprogramming is monitored by a surveillance. To study how the totipotent state is generated, we pioneered single-nucleus Hi-C that enables the genome-wide quantification of chromatin structure in isolated maternal and paternal zygotic nuclei. Both genomes are organized into loops and topologically associating domains that strictly depend on cohesin. Unexpectedly, we discovered that the maternal genome lacks strong compartments. An understanding of this zygotic chromatin ground state could potentially provide insights into reprogramming cells to a state of totipotency.

Monday, February 11, 2019 10:00am - 11:00am
Mondi Seminar Room 2, Central Building

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.