Institute colloquium

Actin-based forces in asymmetric meiotic cell division

Rong Li
Johns Hopkins University & National University of Singapore

Host: Carl-Philipp Heisenberg

Meiotic maturation and fertilization of mammalian oocytes involve two rounds of asymmetric cell divisions generating a large fertilized egg and two small polar bodies. The position and orientation of meiotic spindles are critical for the success of these divisions. The chromatin and multiple actin assemblies play keys roles in these processes. Spindle migration and extrusion of the first polar body is accomplished through a symmetry breaking process involving formin-nucleated actin and dynamic organelle rearrangements. Once the chromatin is positioned subcortically the Arp2/3 complex is activated by the cortex-proximal meiotic chromatin through Ran GTPase signaling. The Arp2/3 complex nucleated actin network powers a cytoplasmic flow that pushes the spindle and chromosome toward the cortex. It also serves to restrict myosin-II-driven cortical contraction, which generates an opposite force moving the meiotic spindle/chromatin toward oocyte interior. During meiosis II, polarization of the two opposing forces provide the torque driving the spindle rotation required for the second meiotic division. These dynamic processes are likely targets of the aging process during female reproductive decline.

Monday, January 18, 2021 10:00am - 11:00am
Raiffeisen Lecture Hall

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.