



## Life Sciences Seminar

# Engineering the shape and mechanics of epithelia

**Xavier Trepas**

Institute for Bioengineering of Catalonia (IBEC)

Host: Carl-Philipp Heisenberg

Biological processes such as morphogenesis, tissue regeneration, and cancer invasion are driven by collective migration, division, and folding of epithelial tissues. Each of these functions is tightly regulated by mechanochemical networks and ultimately driven by physical forces. I will present maps of cell-cell and cell-extracellular matrix (ECM) forces during cell migration and division in a variety of epithelial models, from the expanding MDCK cluster to the regenerating zebrafish epicardium. These maps revealed that migration and division in growing tissues are jointly regulated. I will also present measurements of epithelial traction, tension, and luminal pressure in three-dimensional epithelia of controlled size and shape. By examining epithelial tension over time-scales of hours and for extreme nominal strains we establish a remarkable degree of tensional homeostasis mediated by superelastic behavior. Finally, I will present direct measurements of the forces that shape the intestinal organoid crypt.

**Tuesday, January 21, 2020 11:00am - 01:00pm**

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.