



University of Stuttgart

Stuttgart Research Center Systems Biology



Systems Biology Seminar Talk

Short stories about long RNAs

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Abstract:

Although thousands of non-coding RNAs are encoded in mammalian genomes, their mechanisms of action are largely uncharacterized. One such ncRNA Xist mediates chromosome-wide gene silencing on one of the two X chromosomes to achieve gene expression balance between males and females. However, how a limited number of Xist molecules can mediate robust silencing of a significantly larger number of target genes (~1 Xist RNA: 10 gene targets) while maintaining specificity exclusively to genes on the X within each cell, is unclear. I will present our recent observations uncovering a spatial amplification mechanism that allows Xist to achieve these two essentials but countervailing regulatory objectives: chromosome-wide gene silencing and specificity to the X. I will discuss how this spatial amplification mechanism may be a more general mechanism by which other non-coding nuclear RNAs can balance specificity to, and robust control of, their regulatory targets. Lastly, I will show how our newly developed method RNA-DNA SPRITE can help to understand the 3D nuclear localization of these RNAs and identify their genomic targets at the genome-wide scale.

CV:

Jul 2022 - Present Group Leader, "Dark genome in early mammalian development", IMBA, Vienna BioCenter, Vienna, Austria

Jul 2017 – Jun 2022 Postdoctoral fellow, laboratory of Dr. M. Guttman, California Institute of Technology, Pasadena, USA

Jan 2016 – May 2017 Postdoctoral fellow, laboratory of Dr. M.E. Torres-Padilla Institute of Epigenetics and Stem Cells, Helmholtz Zentrum Munich, Germany

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Host:

Dr. Philipp Rathert

Lecture Hall 0.106

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