



Seewiesen Colloquia

Speaker invited by Dept. Kempenaers

Thursday, 28 January , 2016, 13:00 h, in House 4, Lecture Room

Long non-coding RNAs in evolution and development

Dr. Anamaria Necșulea

Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Mammalian genomes encode tens of thousands of long non-coding RNAs (lncRNAs), which are long transcripts that do not give rise to proteins. To date, only a minuscule fraction of lncRNAs have been experimentally characterized and their functions remain uncertain. Evolutionary studies can provide important insights into the functionality of lncRNAs, by revealing the selective pressures that act on these genes. In this talk, I will present recent insights into the evolution of lncRNAs, stemming from large-scale comparative transcriptomics studies. To study the dynamics of lncRNAs in mammalian development and evolution, we generated and analyzed RNA-seq profile in a series of five developmental stages from mid-gestation embryo to aged individuals, for four major organs, in mouse and rat. We find that lncRNA repertoires, sequences and expression patterns evolve very rapidly. However, we show that there is increased functional constraint on lncRNAs expressed in somatic organs and early in development, and we identify several evolutionarily conserved lncRNAs with potential important roles in developmental processes.

Who is Anamaria Necșulea?

2008 PhD University of Lyon, France

2009 FEBS post-doctoral fellowship, University of Lausanne, Switzerland

2012 Ambizione research fellowship, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Selected publications:

- Necșulea A, Soumillon M, Warnefors M, Liechti A, Daish T, Baker J, Grutzner F, Kaessmann H. 2014. The evolution of lncRNA repertoires and expression patterns in tetrapods. **Nature** 505:635-640.
- Necșulea A, Kaessmann H. 2014. Evolutionary dynamics of coding and non-coding transcriptomes. **Nature Reviews Genetics** 15:734-748.
- Brawand D*, Soumillon M*, Necșulea A*, Julien P, Csardi G, Harrigan P, Weier M, Liechti A, Aximu-Petri A, Kircher M, Albert FW, Zeller U, Khaitovich P, Grutzner F, Bergmann S, Nielsen R, Pääbo S, Kaessmann H. 2011. The evolution of gene expression levels in mammalian organs. **Nature** 478:343-348. (* shared first authors)