Type of presentation: N/A

Chromatin spatial organization and transcription regulation during early embryonic development : the example of ribosomal genes

Chebrout M.[1], Koné M.[1], Adenot P.[1], Fleurot R.[1], Aguirre-Lavin T.[1], Beaujean N.[1], Bonnet-Garnier A.[1]

[1]UMR BDR, INRA, ENVA, Université Paris Saclay, 78350, Jouy en Josas, France

Email of the presenting author: amelie.bonnet-garnier@inra.fr

During pre-implantation period, the newly formed embryo undergoes genome activation and first differentiation to ensure its development to term. These key events correlate with change in transcription states of various group of genes but also with large-scale modifications of chromatin organization. Hence, this period could be useful to evaluate the link between spatial organization of a gene and its transcriptional state at the single cell level.
In this context, we have investigated the organization of specific sequences with 3D-FISH (Fluorescent In Situ Hybridization on 3D-preserved nuclei) approaches. We focus on ribosomal genes (rDNA), located next to pericentromeric regions in mouse and transcribed specifically by the RNA polymerase I. The rDNA are switched off in 1-cell embryos and at the end of the 2-cell stage, rRNA synthesis starts. We have examined the spatial position of these genes during this transition period with regards to the pericentromeric heterochromatin (major satellite sequences) one. We also assess the transcription level by RNA-FISH and qRT-PCR of these two kind of sequences (rDNA and major satellite). We next use a drug, CX-5461 which has been described to specifically inhibit the RNA pol I, to determine the impact of the transcription inhibition on the spatial organization of ribosomal genes

Acknowledgement: This work was supported by the REVIVE Labex and by an INRA bottom-up grant. We acknowledge the MIMA2 Platform.