

Dynamic landscape of peri-cenromeric heterochromatin during transistion from naïve to primed pluripotency

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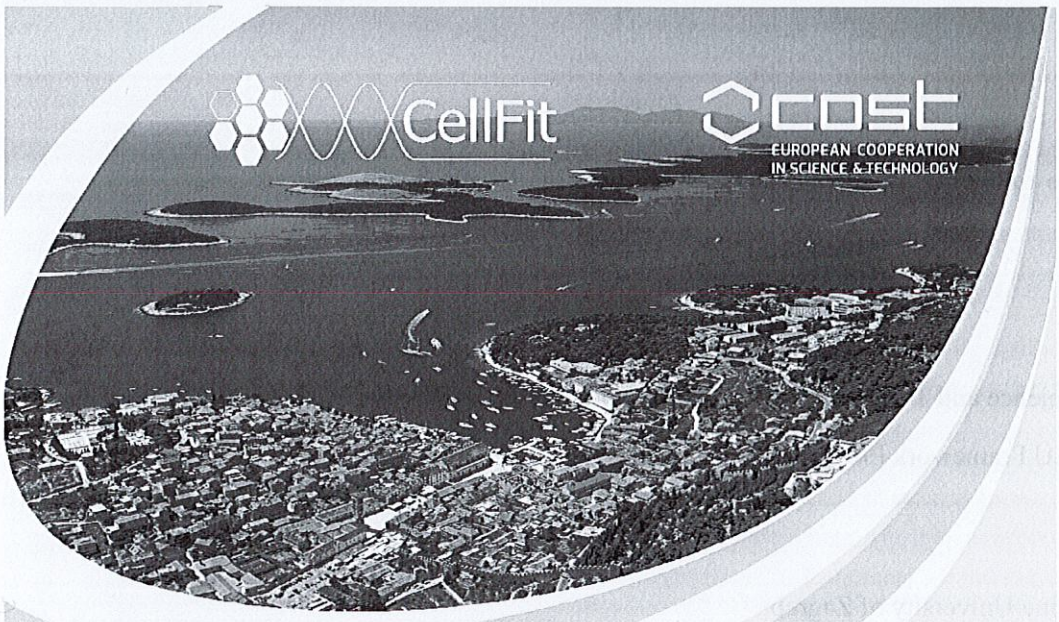
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IN VITRO 3-D TOTAL CELL GUIDANCE AND FITNESS

PROCEEDINGS OF CellFit MEETING 2018

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Dynamic landscape of peri-cenromeric heterochromatin during transition from naïve to primed pluripotency

Pluripotency, defined as the potential to generate all cellular lineages, is a continuous process starting in the inner cell mass (ICM) of the blastocyst and ending up with gastrulation. In the ICM, pluripotent cells are in a naïve state, characterized by an open chromatin conformation, with poor epigenetic controls. Then these cells acquire the competency to differentiate, along with compaction of chromatin, de novo DNA methylation and reshuffling of repressive marks on gene promoters. In such highly changing context, we have studied the fate of the constitutive, peri-centromeric heterochromatin (PCH) in pluripotent cells. We show that it switches from H3K27me3 enrichment to H3K9me3/DNA methylation enrichment, while the transcription status of the repeated sequences that composed PCH sharply decreases. This dynamic pattern appears as a faithful marker of the transition from naïve to primed pluripotency as it happens both in vitro in the different pluripotent cells that mimic both states (ESC and EpiSC, respectively) and in vivo within the late inner cell mass.