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External Seminar Series

Thursday May 30, 2024
11:00AM CRCM Library

Hosted by the Genome Integrity Department (GID)

zoom

DNA replication and cell identity

Abstract: DNA replication has been shown to be required for successful cell fate change across diverse physiological, experimental, and pathologicalcontexts. It is therefore tempting to speculate that passage through S phase is required to remodel chromatin as it is repackaged at the replication fork. The aim of the project I will present is to identify replication coupled mechanisms promoting pluripotency exit and differentiation. To tackle this question, we have established a system to study chromatin replication in human iPS cells, both in pluripotent state and upon differentiation to pre-somitic mesoderm (PSM). We have performed an iPOND-TMT time course experiment in iPS and upon differentiation, isolating nascent and mature chromatin. We identified 482 proteins differentially recruited to replicated chromatin in iPS or PSM. These include many proteins with known functions in gene silencing such as histone writers and erasers for H3K9me3. As H3K9me3 must be re-established upon exit from pluripotency, two proteins involved in H3K9me3 and with opposite recruitment dynamics on newly replicated chromatin were selected for further characterization. Taken together this work has provided unexpected results, with potential of identifying new replication coupled mechanisms promoting cell fate changes.

Constance Alabert, PhD

Shortbio: Dr Constance Alabert is a Principal Investigator in the Molecular Cell and Developmental Biology of the University of Dundee. She works on the duplication of the epigenetic information to maintain cell identity during lineage propagation. She focus her research on the nucleosomes reassembly on newly replicated DNA and dissect the mechanisms that restore epigenetic information during this process. She develop the Nascent Chromatin Capture (NCC), a novel technology that allows the analysis of proteins associated with newly replicated DNA. She further investigate the pathological role of the newly identified chromatin factors, which are deregulated in human diseases as cancer.

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