Chromatin dynamics during nitrogen depletion in fission yeast, *Schizosaccharomyces pombe*

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We are using the fission yeast, *Schizosaccharomyces pombe*, as a model system to study organisation of the genome in the nucleus. We are investigating the correlation between gene activity and localisation in the cell nucleus using the lacO/LacR-GFP system. In this approach lacO-arrays are integrated on the chromosome, and a LacI-GFP fusion protein is expressed in the cell. LacI-GFP will bind to the lacO repeats thereby allowing for the detection of a specific gene locus using immunofluorescence microscopy. Yeast is an excellent model system for this type of studies since the tandem arrays of the lacO sequence can be inserted at specific locus by homologous recombination and changes in localisation due to mutations can be monitored. We have documented a movement of a gene cluster induced by nitrogen depletion, from the nuclear periphery towards the nucleus interior (Alfredsson-Timmins Chromosoma 2009). The change in sub-nuclear localisation is accompanied with drastic changes in nucleosome density, leading to fewer nucleosomes in the region (Krsitell Genome Research 2010). This project aims at understanding the biological function of the change in subnuclear localisation. The project involves tethering the gene cluster to the nuclear membrane preventing it to leave the nuclear periphery during induction and then to monitor how this affects gene induction and changes in nucleosome density.