



2017 IGBMC Summer Internship

Tracking chromatin topology in real-time

Laboratory of Dr Thomas Sexton

The genome a highly organised structure and its folding is correlated with control of gene transcription. Very recently, genome-wide efforts to map chromatin interactions revealed that chromosomes fold into distinct spatial modules, or topologically associated domains (TADs), which appear to delimit functionally distinct portions of the genome. For example, mutations abolishing TAD borders have been shown to cause disease by the inappropriate activation of genes by regulatory elements on neighbouring TADs. These studies have only been possible in large populations of cells; it is thus unknown whether and to what extent TADs are true, long-lived structural features in single cells.

To address this, and to see how TADs are modified by other genetic perturbations, we have developed a system to fluorescently tag specific chromosomal loci and track them by live microscopy. We are seeking a summer student with a background in computing (especially Matlab) to help develop ways to automate our analysis of the images and movies we are making, and thus explore chromosome dynamics in living cells.