Preliminary data and Figures:

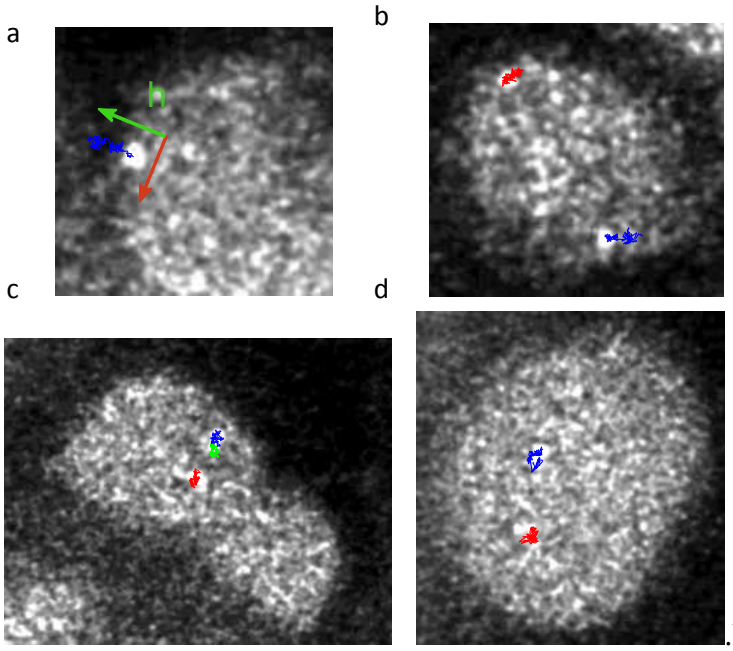

Figure 1: Trajectories of a locus located on the X chromosome (genomic locus within the Tsix TAD), in G1 cells: the green arrow (a) shows the direction with the highest directed motion and the red one is perpendicular. In the other examples (b-d), trajectories are recorded in S phase. ASSAF=what are the 2 two spots. What is the green trajectory?

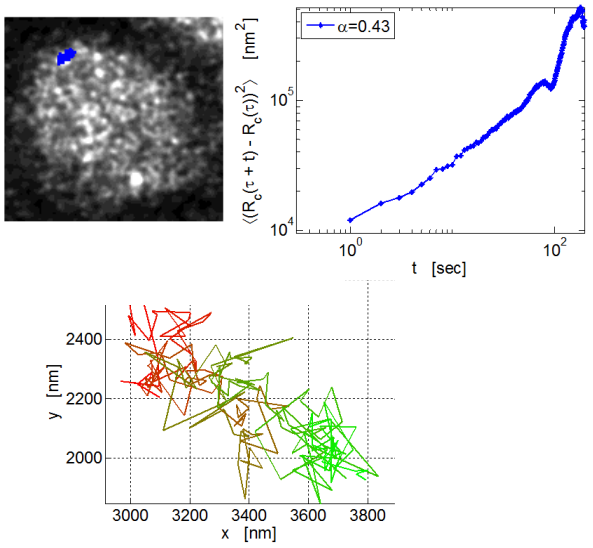

Figure 2: Analysis of a single trajectory.(a) Trajectory of a locus on the X chromosome in day zero of differentiation in a G1 cell. (b) Logarithmic plot of the cross-correlation function $C(t)$. The curve behaves as a power law in time ct^{α}, where the anomalous exponent is $\alpha = 0.43$, c is a constant. (c) Trajectory extracted from (a) plotted at t=0 the (red) and is gradually changes to green.

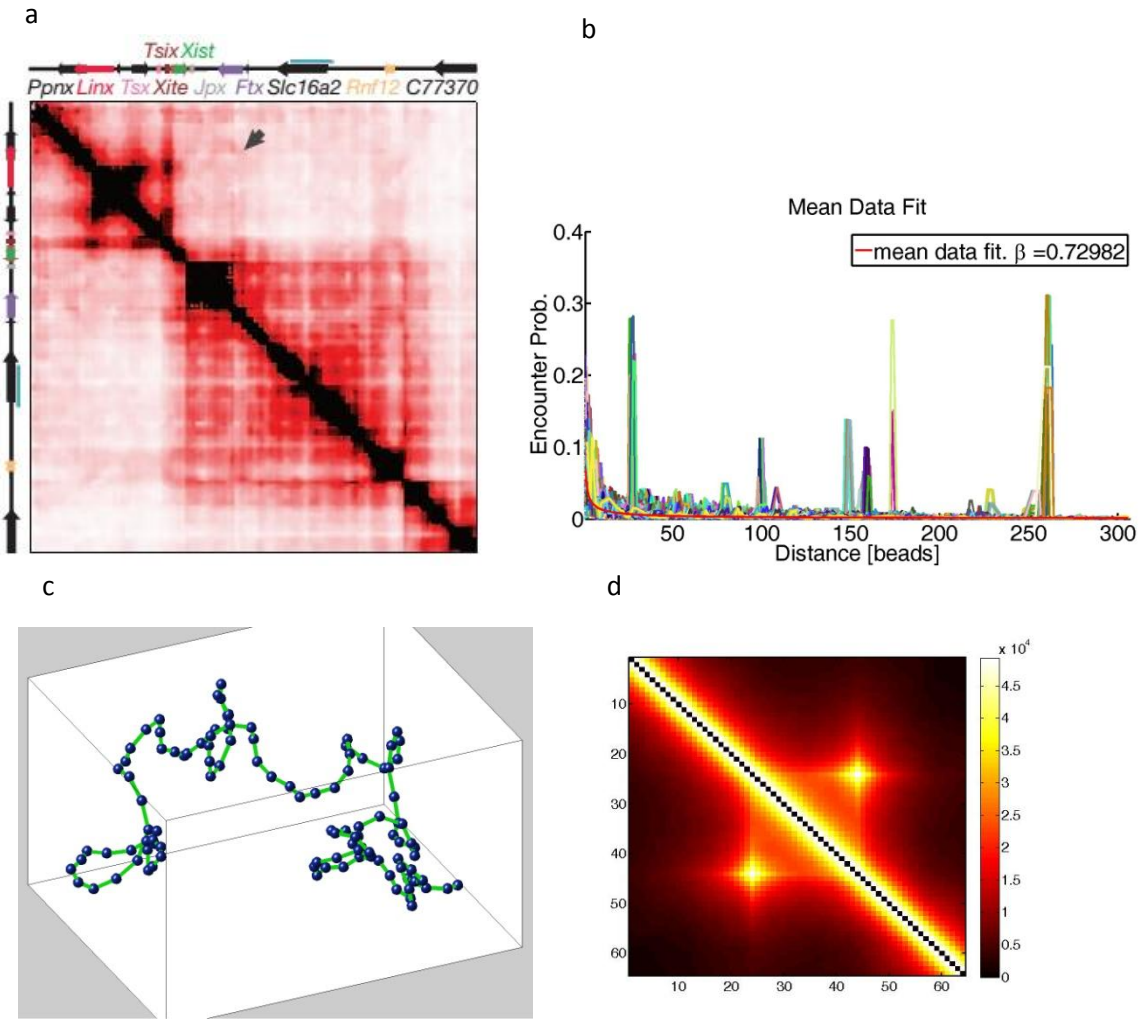

Figure 3: (a): CC-encountner maps showing the regions TADs in the region of the X chromosome (Nora et al.Nature 2012). (b): the encounter probability computed from (a) shows a general decay fitted with a power law. Leading to an anomalous exponent beta=0.7. This exponent allows to define the polymer model to use. (c) examples of polymer interface, where a prescribed anomalous exponent is converted into long range interaction forces. (d) examples of encounter map where a loop is generated between monomer 24 and 44, showing that a TAD can emerge by connecting two monomers (connector).

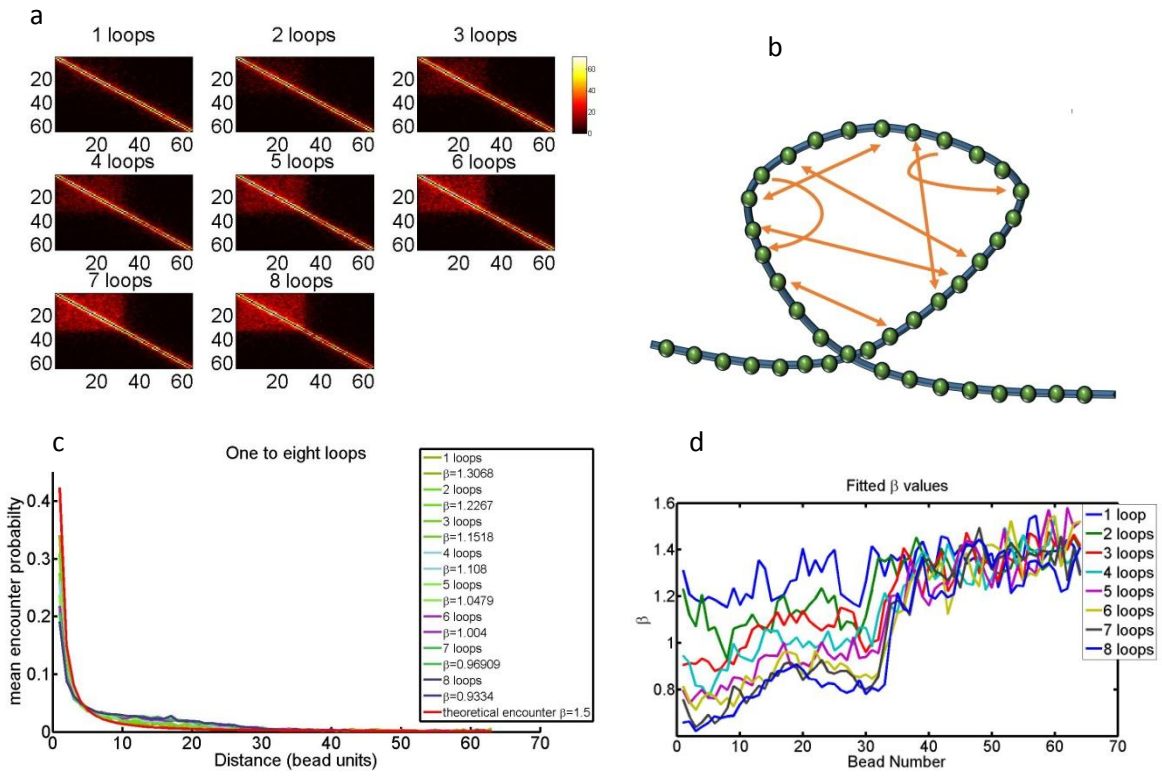

Figure 4: (a) simulation of Rouse polymer with a TAD generated by a loop with 64 beads Rouse model, with random fixed loops in the region 1 to 32.(a) the encounter histogram. as the number of random loops (connectors) increases from 1 to 8, a TAD like-region emerges. (b) schematic example of TAD generated by random connectors. The fitted value (c) for the anomalous exponent is computed for each bead. The mean encounter probability does not vary much for the eight cases. There is a clear transition at 32 (d) for the anomalous exponents: beta larger than 0.5 is due to the presence of forces.