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**Models of chromatin spatial organisation in the cell nucleus**

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In the cell nucleus chromosomes have a complex architecture serving vital functional purposes. Recent experiments have started unveiling the interaction map of DNA sites genome-wide, revealing different levels of organisation at different scales. The principles, though, which orchestrate such a complex 3D structure remain still mysterious. I will overview the scenario emerging from some classical polymer physics models of the general aspect of chromatin spatial organisation. The available experimental data, which can be rationalised in a single framework, support a picture where chromatin is a complex mixture of differently folded regions, self-organised across spatial scales according to basic physical mechanisms. I will also discuss applications to specific DNA loci, e.g. the HoxB locus, where models informed with biological details, and tested against targeted experiments, can help identifying the determinants of folding.