

Identifying 3D Genome Organization in Diploid Organisms via Euclidean Distance Geometry

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The 3D organization of the genome plays an important role for gene regulation. Chromosome conformation capture techniques allow one to measure the number of contacts between genomic loci that are nearby in the 3D space. In this talk, we study the problem of reconstructing the 3D organization of the genome from whole genome contact frequencies in diploid organisms, i.e. organisms that contain two indistinguishable copies of each genomic locus. In particular, we study the identifiability of the 3D organization of the genome and optimization methods for reconstructing it. This talk is based on joint work with Anastasiya Belyaeva, Lawrence Sun and Caroline Uhler.