

Abstract Submitted
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Probing 4D chromatin dynamics in live cells YOON JUNG, Massachusetts Inst of Tech-MIT, KUAN-CHUNG SU, IAIN CHEESEMAN, Whitehead Institute for Biomedical Research, NIKTA FAKHRI, Massachusetts Inst of Tech-MIT — The cell nucleus is a structurally complex architecture whose spatial organization and dynamics play a major role in gene regulation. Here, we introduce a new experimental technique combined with data analysis algorithms to generate live single cell 4D (space-time) chromatin dynamic maps. The technique builds upon the unique near-infrared photoluminescence properties of single-walled carbon nanotubes (SWNTs). We develop a biochemical platform to introduce the SWNTs into the nucleus of HeLa cells and covalently attach them to specific loci. We track the position of individual SWNTs in the nucleus with high temporal and spatial resolution to create dynamic correlation maps of interactions between different loci and uncover patterns of individual and collective motions and organization.

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