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Spatio-genetic Imaging with DNA Microscopy

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ABSTRACT

Complex cell populations, from the brain to the adaptive immune system, rely on diverse gene variants, somatic mutations, and expression patterns for some of their most essential functions. This genetic heterogeneity not only endows intrinsic properties to individual cells, but it also often operates at the level of inter-cellular interactions. Technologies that jointly resolve both gene sequences and the spatial relationships of the cells that express them therefore have a key role to play in deepening our understanding of tissue biology. In this talk, I introduce DNA microscopy, a new imaging modality that operates by encoding pairwise distances between hundreds of thousands of biomolecules in a sample directly into a DNA sequence library using a stand-alone reaction-diffusion system. I will present experimental proofs of principle that demonstrate the efficacy of a simple probabilistic model for solving the basic DNA-to-image inverse problem. I will further describe open computational questions for enhancing the scope and resolving power of the technology.

For further information and inquiries about building access for persons with disabilities, please contact Jonathan Rodriguez at 773.702.8333 or send him an email at jgrodriquez@galton.uchicago.edu. If you wish to subscribe to our email list, please visit the following website:
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