

Abstract Submitted
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Single-Molecule Denaturation Mapping of Genomic DNA in Nanofluidic Channels WALTER REISNER, Dept. of Physics, Brown University, NIELS LARSEN, ANDERS KRISTENSEN, DTU Nanotech - Dept. of Micro- and Nanotechnology, Technical University of Denmark, JONAS O. TEGENFELDT, Department of Physics, Division of Solid State Physics, Lund University, HENRIK FLYVBJERG, DTU Nanotech - Dept. of Micro- and Nanotechnology, Technical University of Denmark — We have developed a new DNA barcoding technique based on the partial denaturation of extended fluorescently labeled DNA molecules. We partially melt DNA extended in nanofluidic channels via a combination of local heating and added chemical denaturants. The melted molecules, imaged via a standard fluorescence videomicroscopy setup, exhibit a nonuniform fluorescence profile corresponding to a series of local dips and peaks in the intensity trace along the stretched molecule. We show that this barcode is consistent with the presence of locally melted regions and can be explained by calculations of sequence-dependent melting probability. We believe this melting mapping technology is the first optically based single molecule technique sensitive to genome wide sequence variation that does not require an additional enzymatic labeling or restriction scheme.

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