## Abstract Submitted for the MAR15 Meeting of The American Physical Society

How to get into that "room at the bottom" of DNA analysis<sup>1</sup> DANIEL BERARD, FRANOIS MICHAUD, SARA MAHSHID, JALAL MO-HAMMED AHAMED, McGill University, PIERRE BÉRUBÉ, ROBERT SLADEK, Genome Québec Innovation Centre, WALTER REISNER, SABRINA LESLIE, McGill University — Linearly extending long DNA molecules in sub-50 nm nanochannels for genomic analysis, while retaining their structural integrity, is a major technological challenge. We employ "Convex Lens-induced Confinement" (CLiC) microscopy to gently load DNA into nanogrooves from above, overcoming the limitations of side-loading techniques used in direct-bonded nanofluidic devices. In the CLiC technique, the curved surface of a convex lens is used to deform a flexible coverslip above a glass substrate, creating a nanoscale gap that can be tuned during an experiment to load and confine molecules into nanoscale features embedded in the bottom substrate. Since DNA molecules are loaded into the embedded nanotopography from above, CLiC eliminates the need for the high pressures or electric fields required to load DNA into direct-bonded nanofluidic devices. To demonstrate the versatility of CLiC, we confine DNA to a variety of nanostructures, demonstrating DNA nanochannel-based stretching and denaturation mapping. In particular, we have successfully extended DNA in 27 nm channels, achieving high stretching (90 percent) that is in good agreement with Odijk deflection theory, and we have mapped genomic features using denaturation analysis.

<sup>1</sup>NSERC, CIHR

Daniel Berard McGill University

Date submitted: 14 Nov 2014

Electronic form version 1.4