

Abstract Submitted
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Sensing Labeled and Immunocomplexed DNA with solid-state nanopores¹ BRIAN THOMAS, DANIEL FOLOGEA, DAVID S. MCNABB, Department of Biological Sciences, University of Arkansas, Fayetteville, AR 72701, JIALI LI, Department of Physics, University of Arkansas, Fayetteville, AR 72701 — We report the detection of labeled and immunocomplexed DNA molecules using silicon nitride nanopores. We compared the characteristics of the current blockade signal measured from double-stranded DNA, biotinylated DNA, and immunocomplexed DNA samples. Single biotin-binding site Fab fragments as well as multiple-binding sites Monoclonal Biotin Antibodies were used to bind biotinylated DNA molecules. The electrical current blockage signature measured from the nanopores show that the current drop amplitude, time duration, and the integrated area of events can be used to discriminate DNA with and without labels, and the species of the labels. Our studies show that the single molecule nanopore measurement is more sensitive than bulk electrophoresis in detecting labeled DNA molecules.

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Jiali Li

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