Electronic Supplementary Material (ESI) for ChemComm.

Electro-optical detection of single λ-DNA

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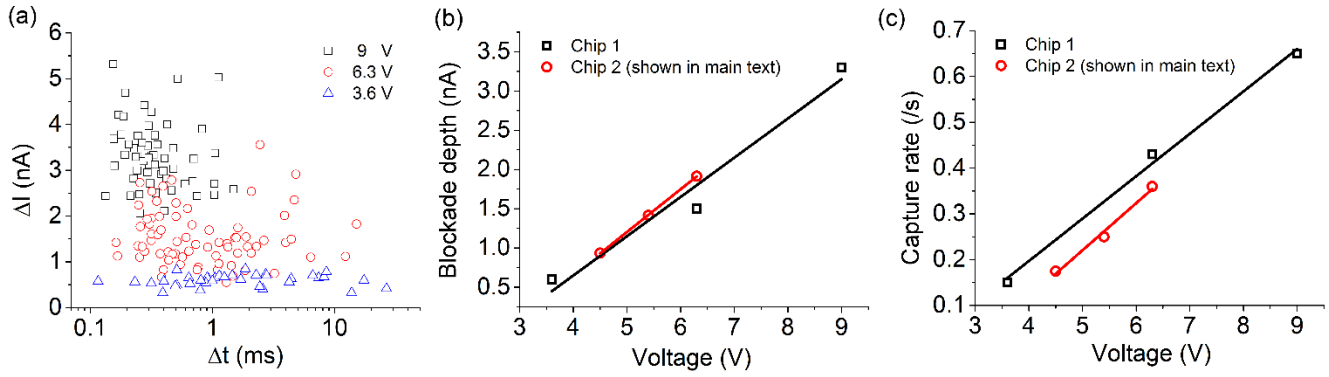

Figure S1. (a) Scatter plot of blockade depth versus duration. Data were from a 20nm nanopore fabricated on another device. Voltages across the nanopore were 3.6V, 6.3V, and 9V. (b) Comparison between two devices. Presented are the plots of blockade depth versus voltage, and the linear fit lines. (c) Comparison between two devices. Presented are the plots of capture rate versus voltage, and the linear fit lines.

In order to assess the reproducibility of the integrated nanopore approach, a 20nm diameter nanopore was fabricated on a different chip and a different batch of λ-DNA molecules was analyzed. The results for single molecule detection with this nanopore are shown in the figure above. Fig. S1a clearly shows that the electrical signal has different blockade depths under different voltages. Again, the blockade durations are more widely spread at lower voltages, consistent with our findings and interpretations in the main text. Fig. S1b shows that the average blockade depth increases linearly with applied voltage, again in agreement with Fig. 2c in the main text. Here, we find an increase in blockade depth with a rate of 500 pA/V, which is only 8% different from the value in the main text. Fig. S1c shows that, once again, a linear dependence of the capture rate on rising voltage across the nanopore is observed, confirming the diffusion-limited nature of the translocation process. We extract a dependence of the capture rate on applied voltage of 0.1 $s^{-1}V^{-1}$ (Fig. S1c), which is the same as the value in the main text. Finally, we note that the above measurement was run under different applied voltages (here: 3.6~9V, manuscript: 4.5~6.3V), suggesting the reproducibility over a wider voltage range.