

Supporting Information

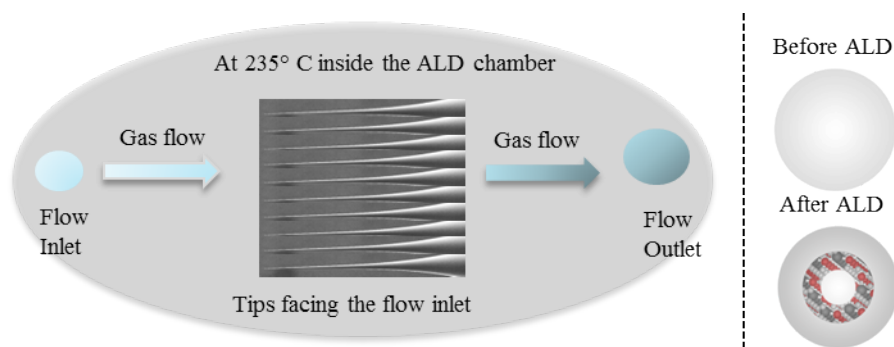


Figure S1 Schematic of 10 pipettes inside the ALD chamber at one time showing process of ALD deposition of the nanopipette. 10 pipette tips face the flow inlet and allowed conformal deposition on every exposed surface of the pipettes. It also shows the plane view of the pipette tip before and after the Al_2O_3 ALD deposition.

$$G = \frac{d_i D_i \pi \sigma}{4 \left(l + \frac{\pi}{8} (d_i + D_i) \right)}$$

Equation 1 Estimate pore diameter from the Conductance. The pore diameter of the pipette can be obtained from the measured conductance. Here, d_i is the nanopore diameter, l the taper length of the capillary, D_i the internal diameter of the capillary at the large end of the taper and σ the electrical conductivity of the solution filling the nanopore.

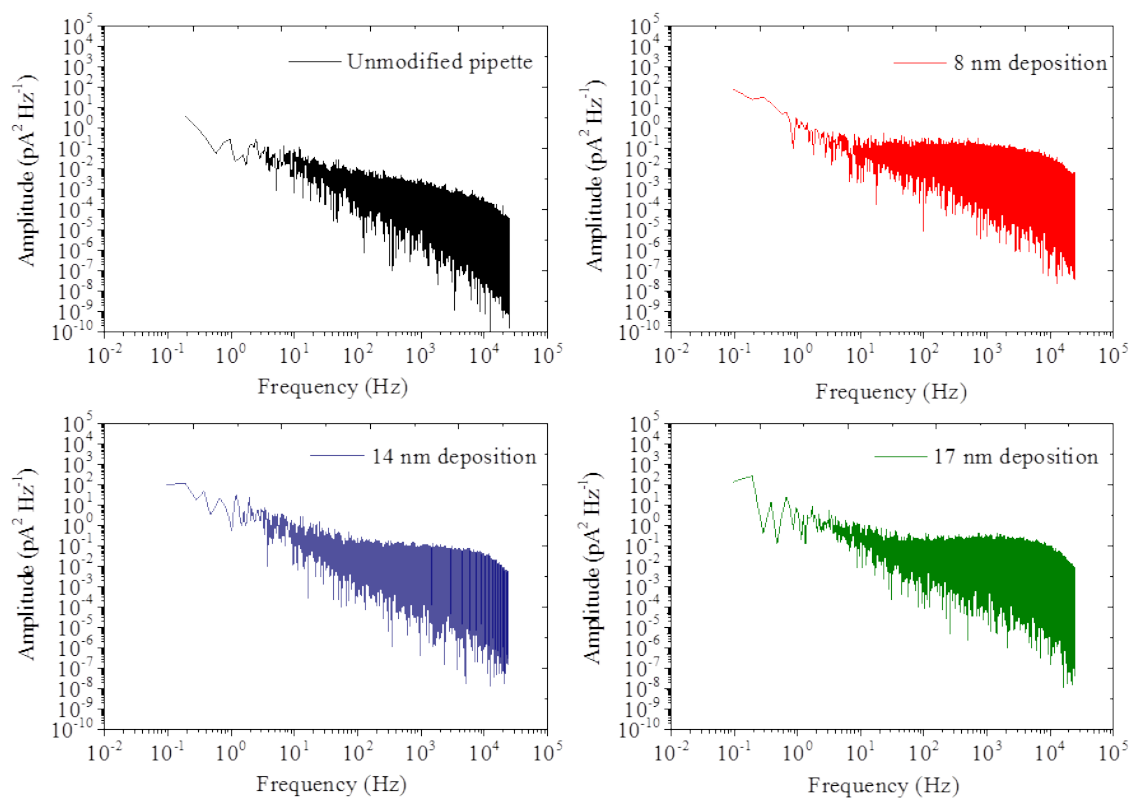


Figure S2 PSD for the modified and unmodified pipettes on d_i. PSD of pipettes modified with 0 nm (black), 8 nm (red), 14 nm (blue) and 17 nm (green) layers of Al₂O₃. These spectra were obtained from data measured using 1 M buffered KCl at 300 mV and filtered using a 4-pole Bessel low pass filter at 10 kHz.

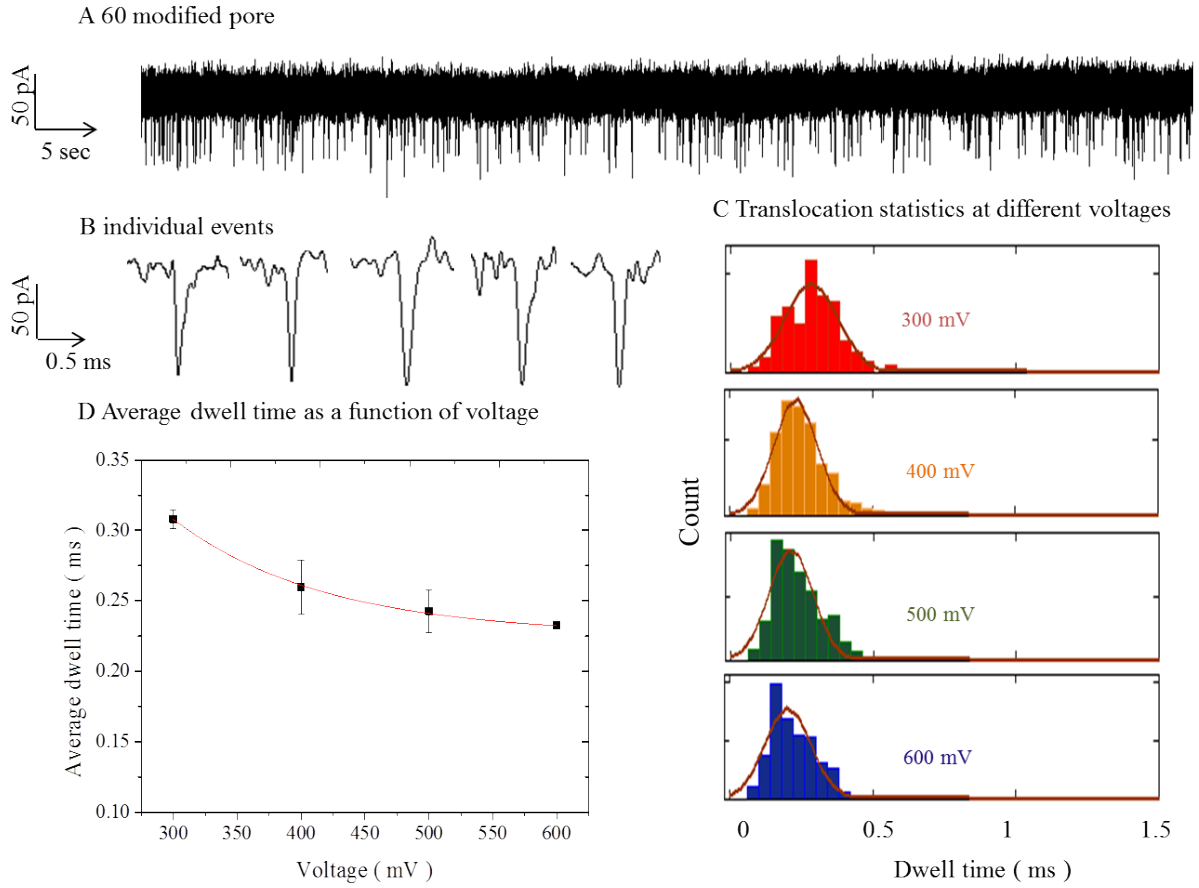


Figure S3 A Typical current trace on 60 nm modified pores after the addition of 100 pM of 10 kbp DNA at 300 mV. Discrete drops in the ion current are clearly observed and corresponding to pore blockades due to the translocation of DNA molecules. B Representative single molecule events on expanded scale. C Translocation event distribution with applied voltages from 300 – 600 mV. D The average dwell times were 0.30 ± 0.01 , 0.25 ± 0.02 , 0.24 ± 0.02 and 0.23 ± 0.01 ms.

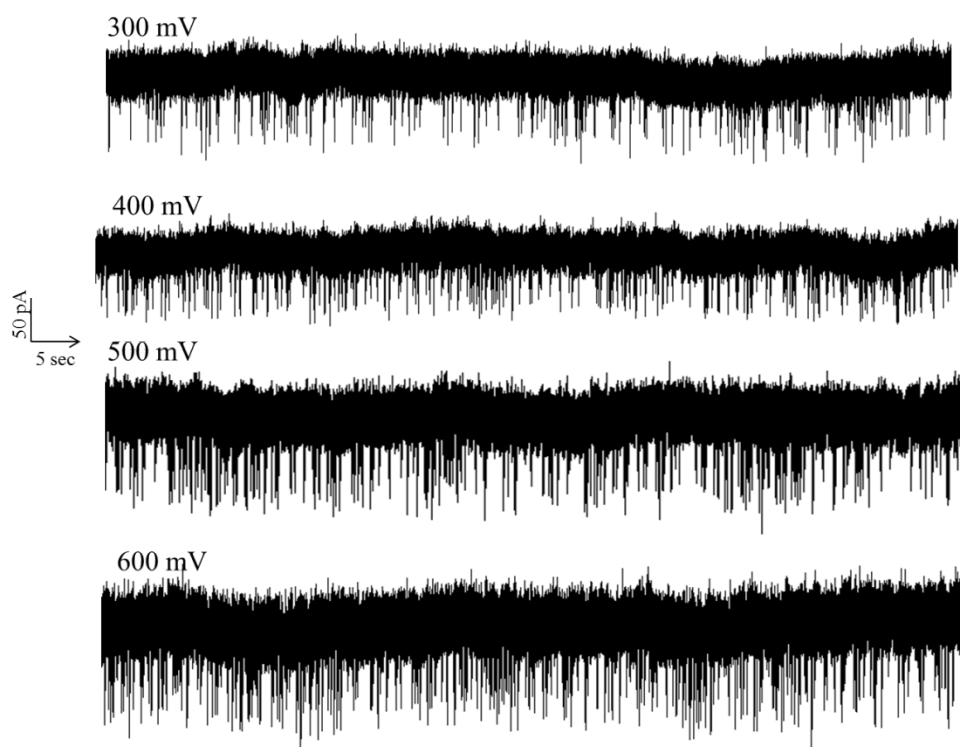


Figure S4 Current - time trace from 60 nm modified pore between voltages from 300 – 600 mV.

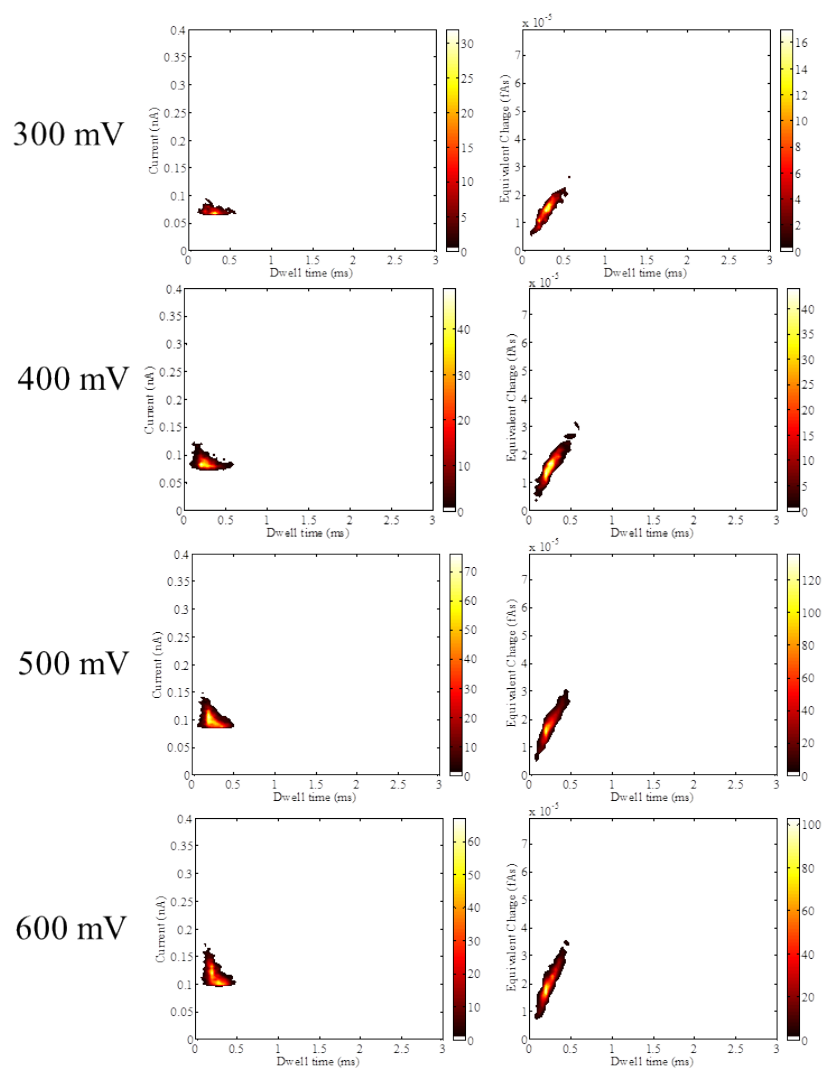


Figure S5 Scatter Current - time trace from 60 nm modified pore between voltages from 300 – 600 mV.

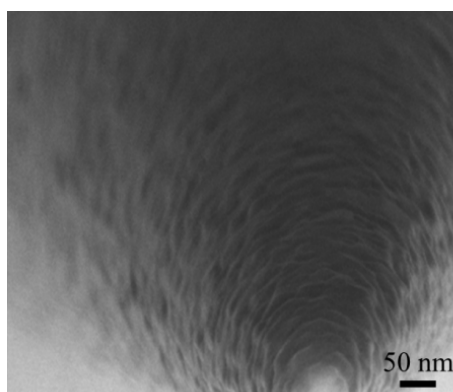


Figure S6 Additional SEM image to show the conformational deposition with the Al_2O_3 ALD.