

Supplementary Information Section 7

S7. Fabrication on SiO₂ Membranes.

We fabricated nanopores in 20-nm thick SiO₂ membranes purchased from SIMPore (TEMWindows – product# SO100-A20Q33). A weaker electric field strength was needed to fabricate a nanopore in SiO₂ in a given time compared to SiN, which we attribute to the reduced dielectric constant, and is consistent with dielectric breakdown mechanism for the pore formation. Figure S8 shows the nanopore creation event during a 2 s pulse at 7.5V and continued enlargement at 8V, as well as the resulting I-V curve of the nanopore, showing an effective diameter of 6.2-nm. We successfully confirmed the ability of the nanopore to detect DNA by studying the translocation of 10-kpb dsDNA molecules.

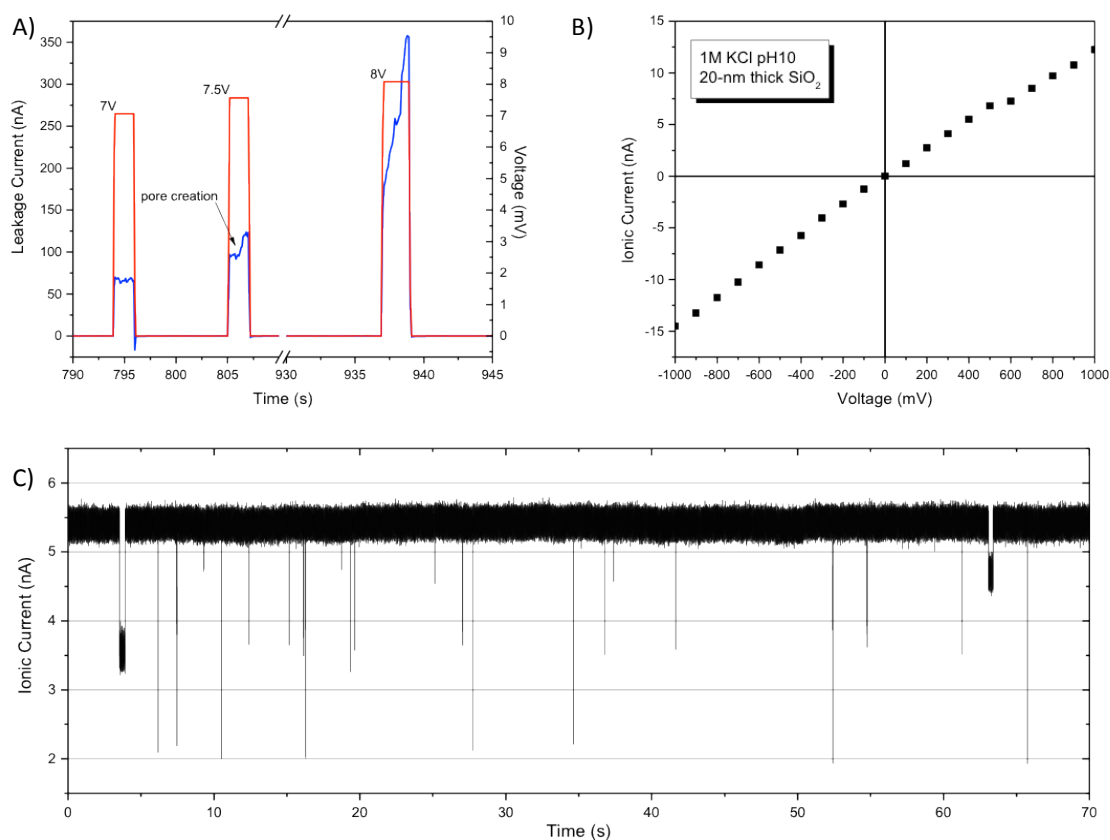


Figure S8: A) Leakage current versus time for different strength of applied voltage pulses. Pore creation happens during the 2s pulse at 7.5V, and is enlarged during the subsequent 8V pulse. B) I-V curve of the resulting nanopore, with an effective diameter of 6.2-nm. C) Ionic current trace at 400mV in 1M LiCl pH8, showing characteristics blockages from translocating 10kpb dsDNA molecules.