Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Information

A label-free DNAzyme-based nanopore biosensor for highly sensitive and selective lead ion detection

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Table S1 I/I_0 and τ_{off} values of different DNAs in this assay through α-HL nanopore

DNA	I/I_0	τ_{off} / ms
Substrate	74.89% ± 0.25%	28.78±1.97
DNAzyme	86.60% ± 0.56%	0.49±0.05
Mixture of 3'-product and 5'-product	87.08% ± 0.48%	0.64±0.15

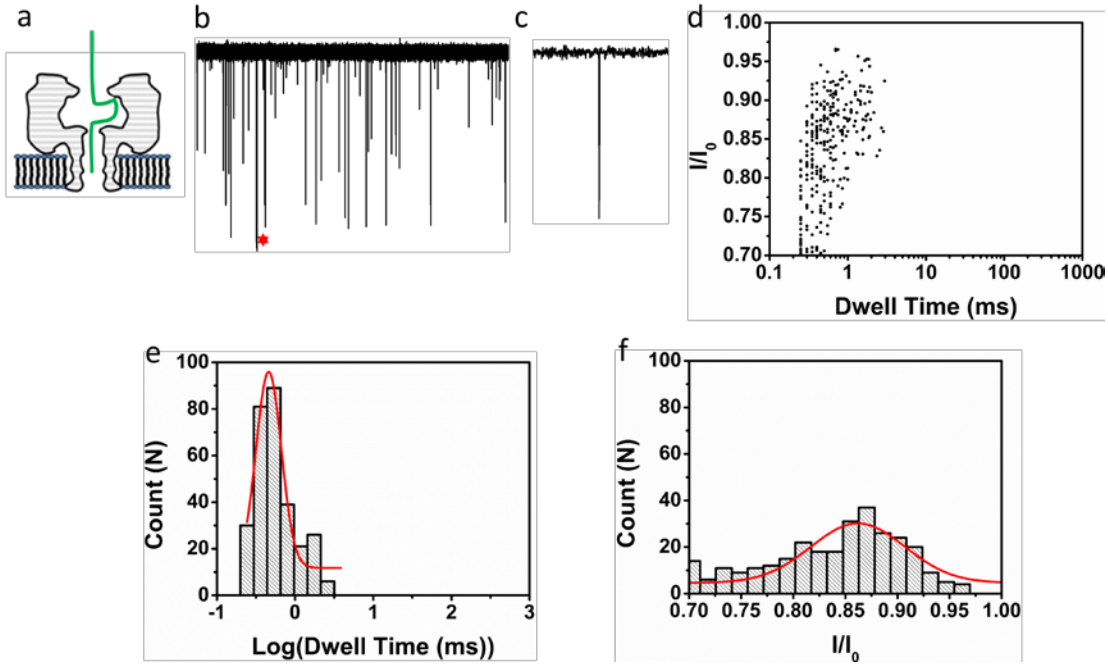

Fig. S1 Representation of the characteristic blocked signals of DNAzyme similar to those of 3′-product and 5′-product mixture in a single α-HL nanopore. (a) Schematic illustration of DNAzyme interacting with or translocating through a single α-HL nanopore. (b) Representative single-channel current traces for the tests of DNAzyme. (c) Expanded view of the signal indicated in the traces by the red asterisks. (d) Scatter plot of blocked signals of DNAzyme. (e) Histograms of dwell times for the DNAzyme. Histograms were fit to Gaussian distributions. (f) Histograms of normalized current blockade I/I_0 for the DNAzyme. Each histogram was fit to a Gaussian distribution. All tests were performed in cis buffer with the transmembrane potential held at +120 mV. Each experiment was repeated three times.

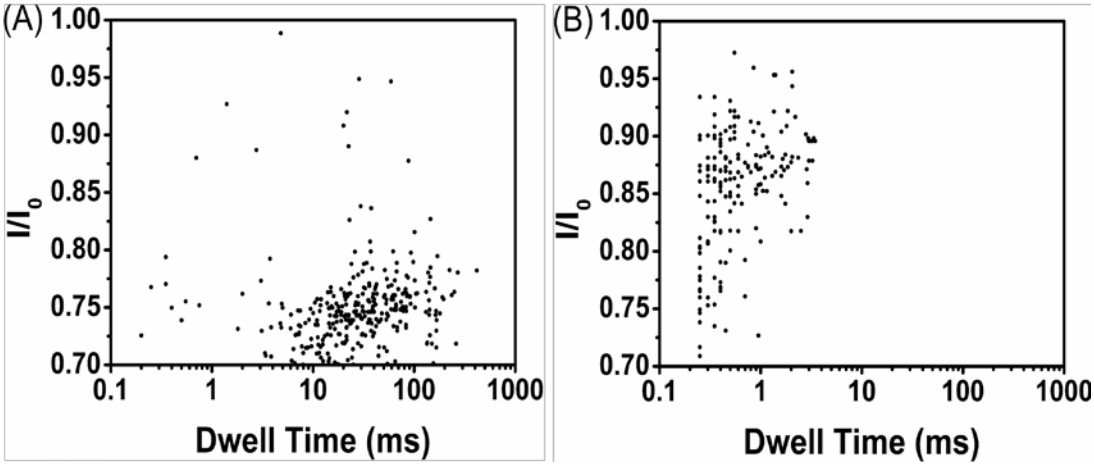

Fig. S2 Scatter plots of characteristic current signals of hairpin substrate (A), 3′-product and 5′-product mixture.

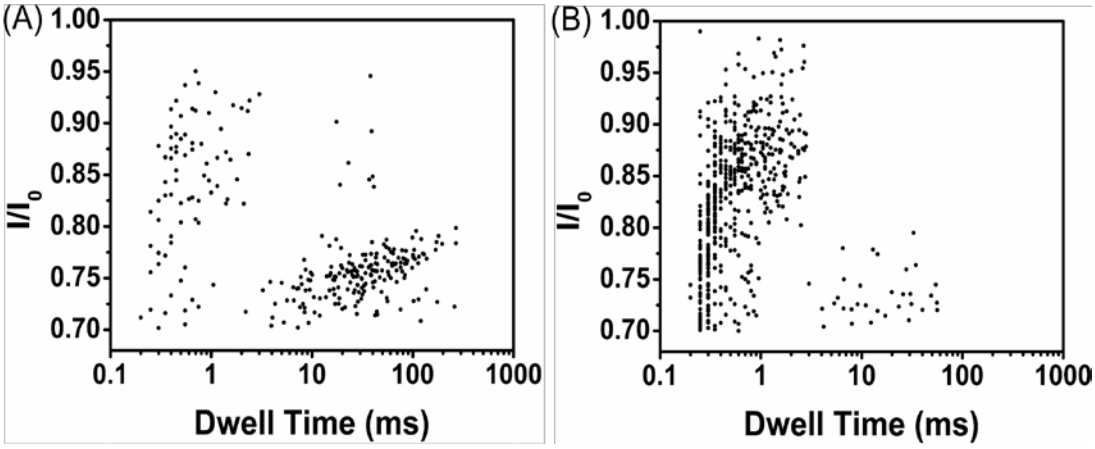

Fig. S3 Scatter plots of characteristic current signals of hairpin substrate and DNAzyme mixture without (A) and with (B) Pb^{2+}.