Online Supporting Materials

iPhone-imaged and cell-powered electrophoresis titration chip for alkaline phosphatase assay in serum by moving reaction boundary

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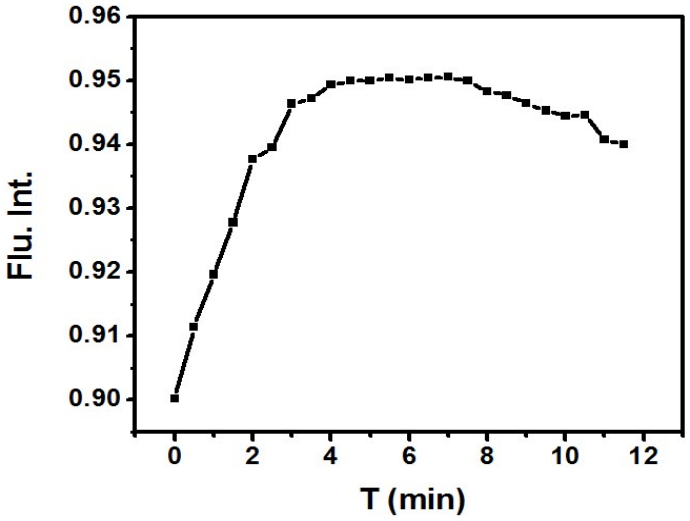

Figure S1. The fluorescent intensity changes with the reaction time of ALP.

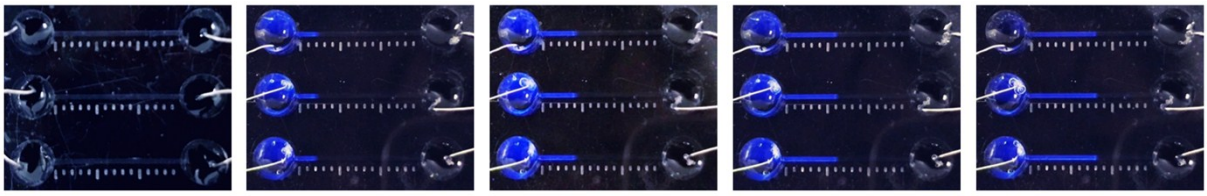

Figure S2. The photos obtained by cell phone of the MRB displacements during 0-2 min run of MRB created with the acidic buffer of Tris-HCl (pH 6.0) and the alkali of $[4\text{-MU}]^-$ catalyzed by ALP.

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[1] The first two authors have equal contribution to the work.

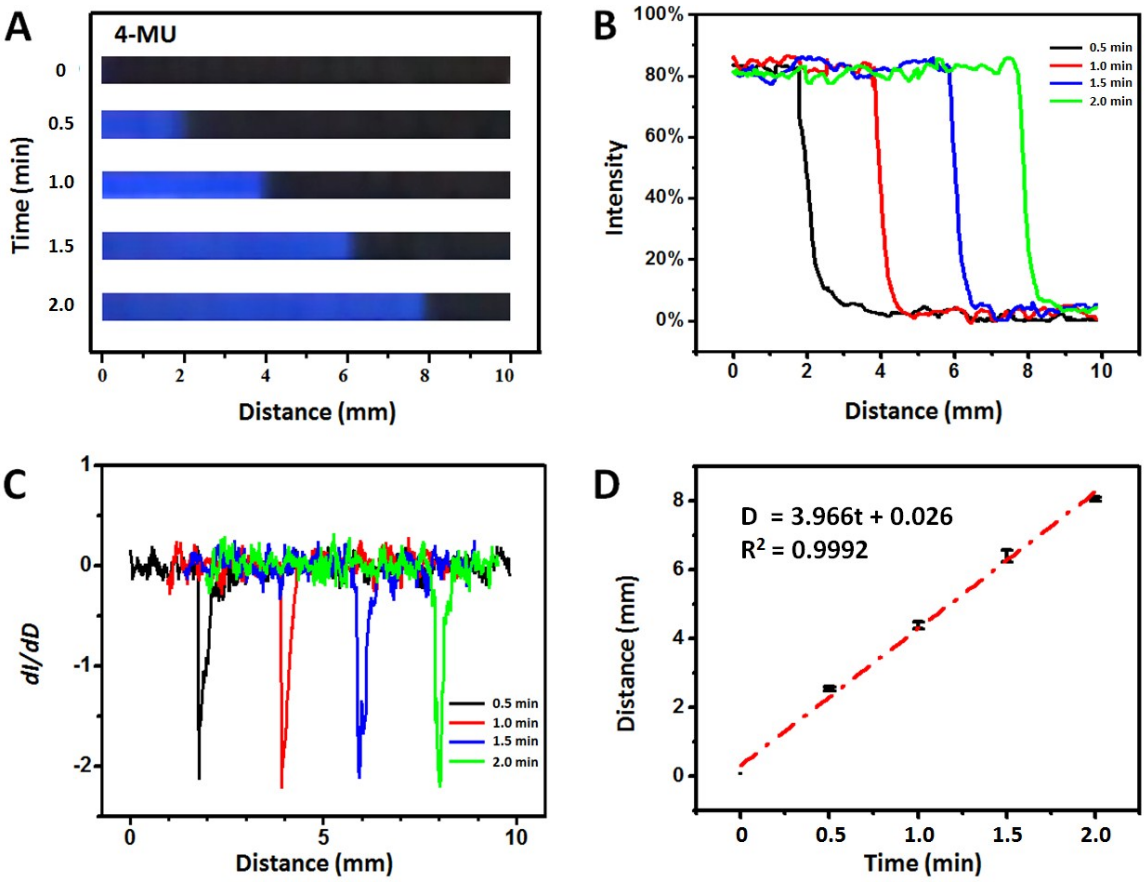

Figure S3. Experiments on ALP-ET chip and data analysis. (A) Boundary displacements during 0-2 min run of MRB created with the acidic buffer of Tris-HCl (pH 6.0) and the alkali of $[4\text{-MU}]^-$ catalyzed by ALP; (B) Raw intensity data vs moving distance obtained by MetaMorph software through line scanning along MRB moving direction; (C) Determination of MRB location via differential curves of dI/dD vs distance in 2 min; (D) Calibration curves of boundary moving distance vs time, and the error bars were given. Operation conditions: 3.0 U/L ALP, 6.5 mM 4-MUP, Na_2CO_3-$NaHCO_3$ buffer (pH 9.6), Tris-HCl buffer (pH 6.0), 100 mM KCl, 1% agarose gel, 2 V/mm and 25 °C room temperature. Three parallel ET runs were made for each point.

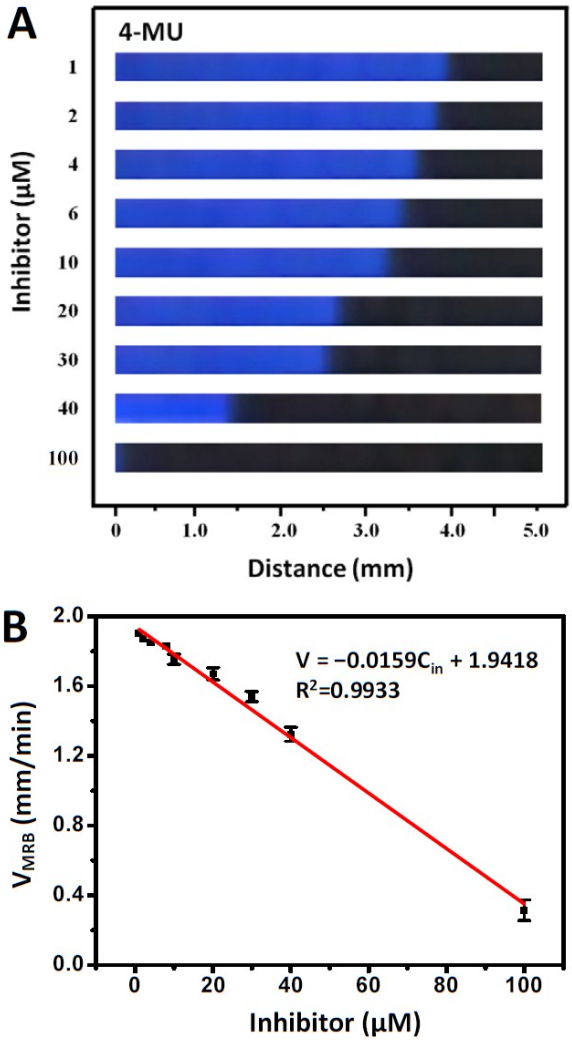

Figure S4. (A) Boundary displacements at 1 min of ALP-ET in the presence of Na_3VO_4 with different concentrations (from 1 μM to 100 μM); (B) Regression curve of MRB moving velocity vs inhibitor concentration: $V = -0.0159C_{in} + 1.9418$, $R^2 = 0.9933$. Three parallel runs were made for each point.

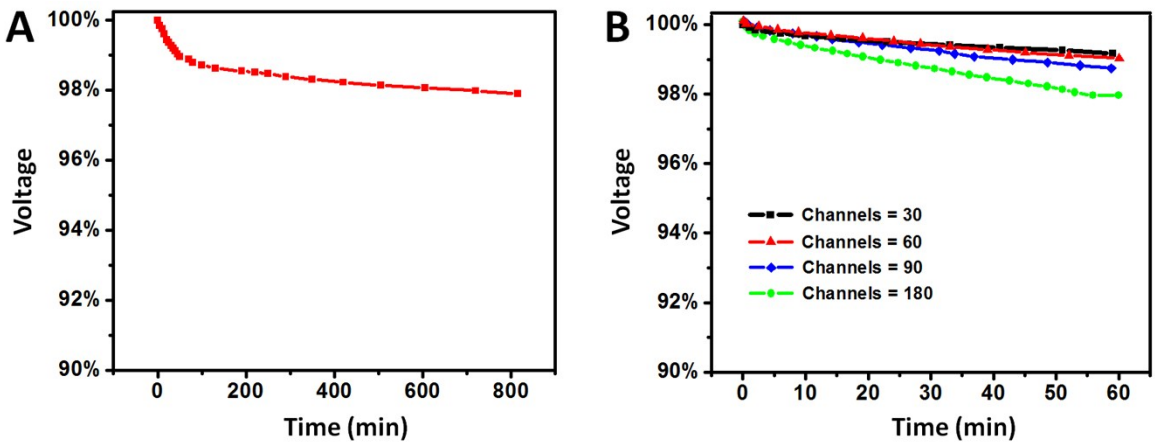

Figure S5. Stability/durability of the lithium cell. (A) Stability of the obtained signal when the cell successively worked; (B) The maximum number of the proposed assay per one cell fully charged (180 channels/cell) in 60 minutes.