

Supplementary Information for  
**Selective On-chip DNA Synthesis using Electric-Field-  
assisted PCR**

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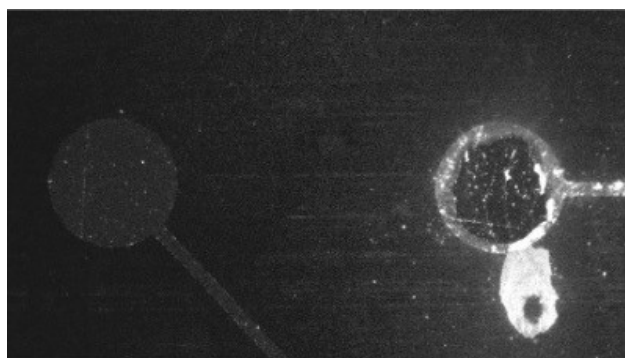
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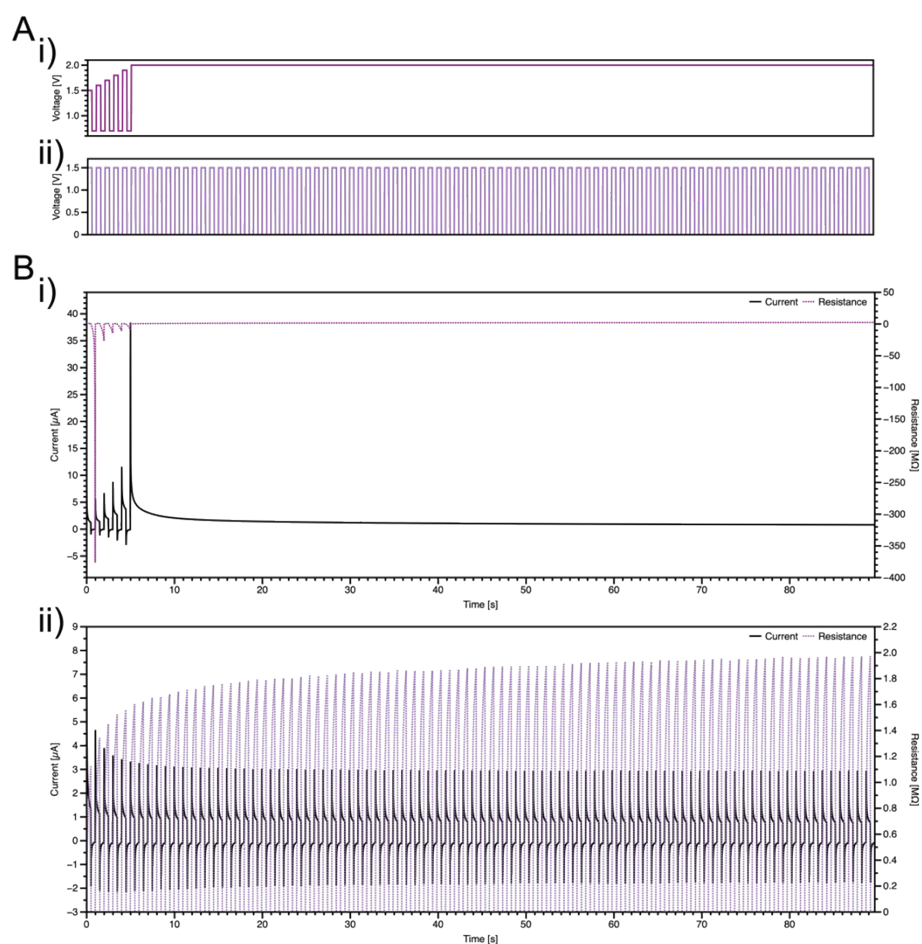
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**Table 1.** Comparison of electric field-based platforms

<b>Parameter</b>	<b>Heller et al. (26)</b>	<b>Song et al. (30)</b>	<b>Wong &amp; Melosh (31)</b>	<b>Lim et al. (38)</b>	<b>This work</b>
<b>Electric field role</b>	Accumulation, hybridization	Positioning	Hybridization, melting	DNA Hybridization	Immobilization, hybridization, synthesis
<b>Binding strategy</b>	Indirect polymer permeation layer	Indirect polymer permeation layer	Direct thiol-Au linkage	Direct SAM (cysteamine-Au)	Direct SAM (cysteamine-Au)
<b>Electric field-assisted DNA synthesis</b>	N/A	N/A	N/A	No	Yes (Klenow fragment)
<b>Application</b>	Genotyping, SNP detection	DNA memory, computing	Drug delivery, cellular signaling	Biosensor platform, molecular detection system	DNA data storage, synthetic biology, molecular diagnostics



**Figure S1.** Fluorescence microscopy image DNA-immobilized gold electrodes after continuous 2.0V application for 30min.



**Figure S2.** (A) Voltage profile over longer time periods for i) Pattern I (step-increase voltage from 0.5 V to 2.0 V and 0.5 V offset) and ii) Pattern II (pulsed alternating voltage between 0 V and 1.5 V at 0.5 s intervals). (B) Current and resistance profile of Pattern I and Pattern II.