Electronic supplementary information (ESI): electrochemical cell lysis device for DNA extraction

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Tables

Table S1. The electrochemical devices with different size and shape

Device no.	Device shape	Electrode distance	Electrode width
1	□	1 mm	1 mm
2	□	1 mm	0.5 mm
3	□	0.5 mm	1 mm
4	□	0.5 mm	0.5 mm
5	Π	1 mm	1 mm
6	Π	1 mm	0.5 mm
7	Π	0.5 mm	1 mm
8	Π	0.5 mm	0.5 mm

* □: Closed electrodes

** Π: Open electrodes

Figures

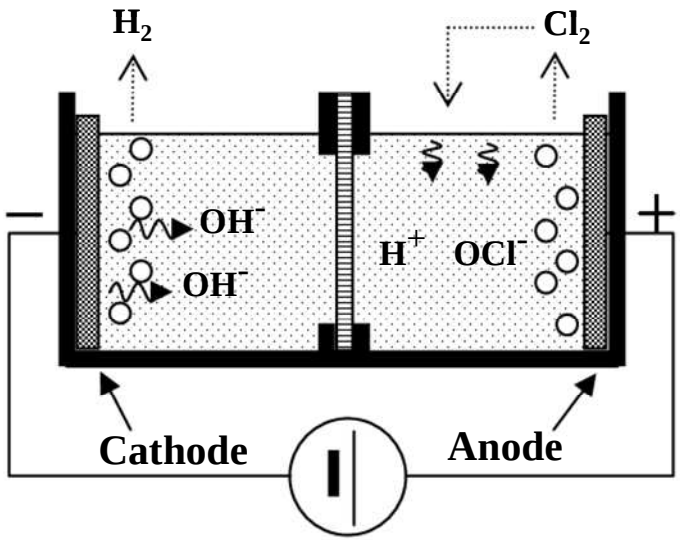


Fig. S1 Apparatus to prepare the electrolyzed solutions. At the cathode chamber, hydroxide ions were generated to form ECS. At the anode chamber, hydrogen ions and HOCl were produced to form EAS.

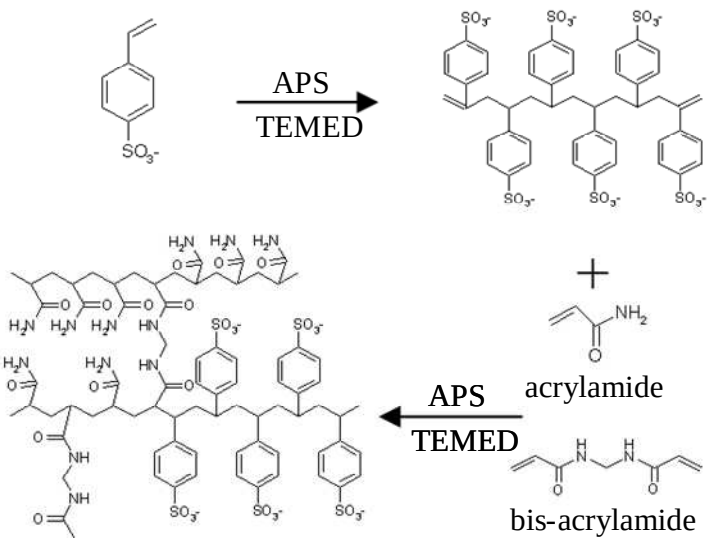


Fig. S2 Reaction scheme to synthesize the ion exchangeable polymer. After polymerization of SVS at 70 °C, acrylamide and BIS were added. APS and TEMED served as initiator and accelerator, respectively.

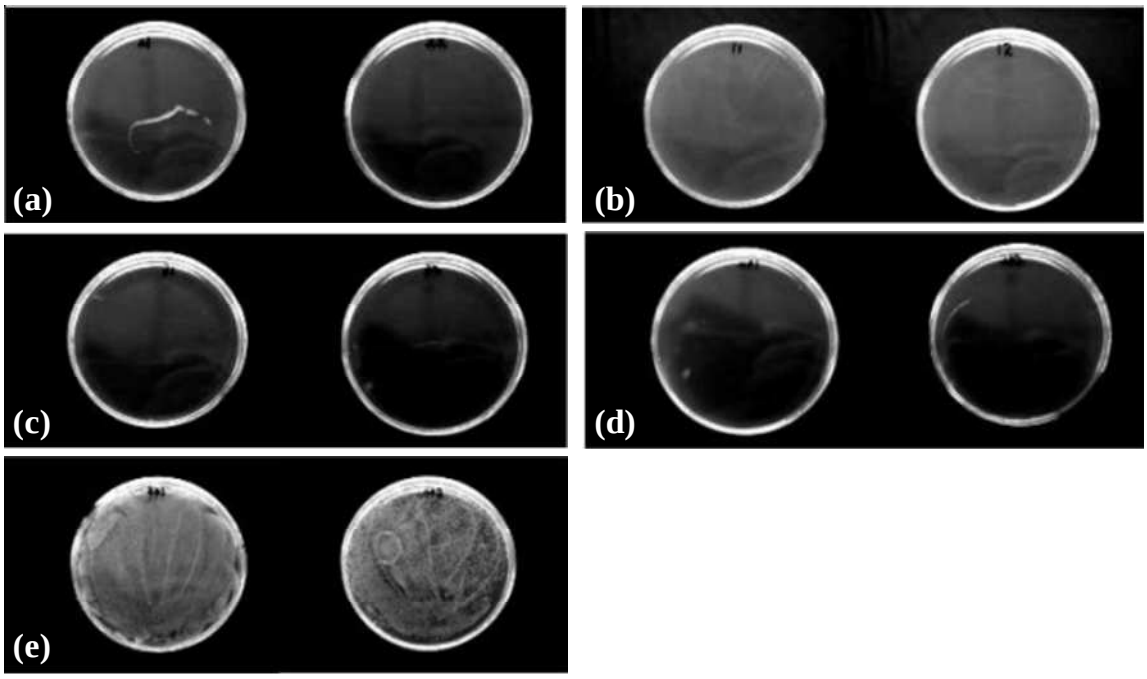


Fig. S3 Images of E. coli cells after overnight incubation at 37 °C. Cell densities in the left Petri dishes and the right Petri dishes in each image were 10^8 cell/ml and 10^7 cells/ml, respectively. Cells were pretreated with (a) ECS, (b) EAS, (c) ETS, or (d) boiling. (e) Control cells without any pre-treatment.

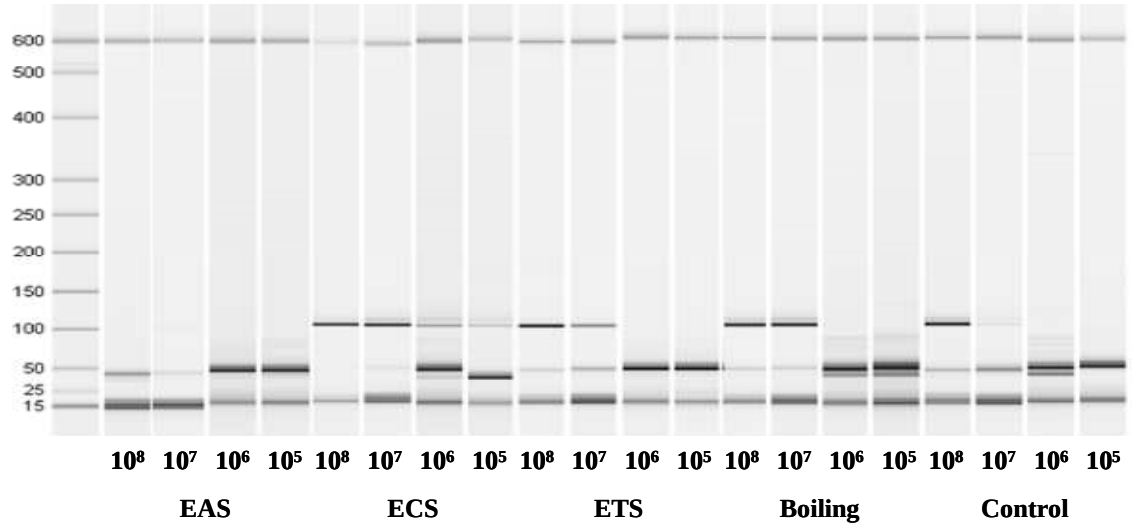


Fig. S4 Labchip analysis of PCR amplicons from treated cells of various concentrations (10^8, 10^7, 10^6 and 10^5 cells/ml).

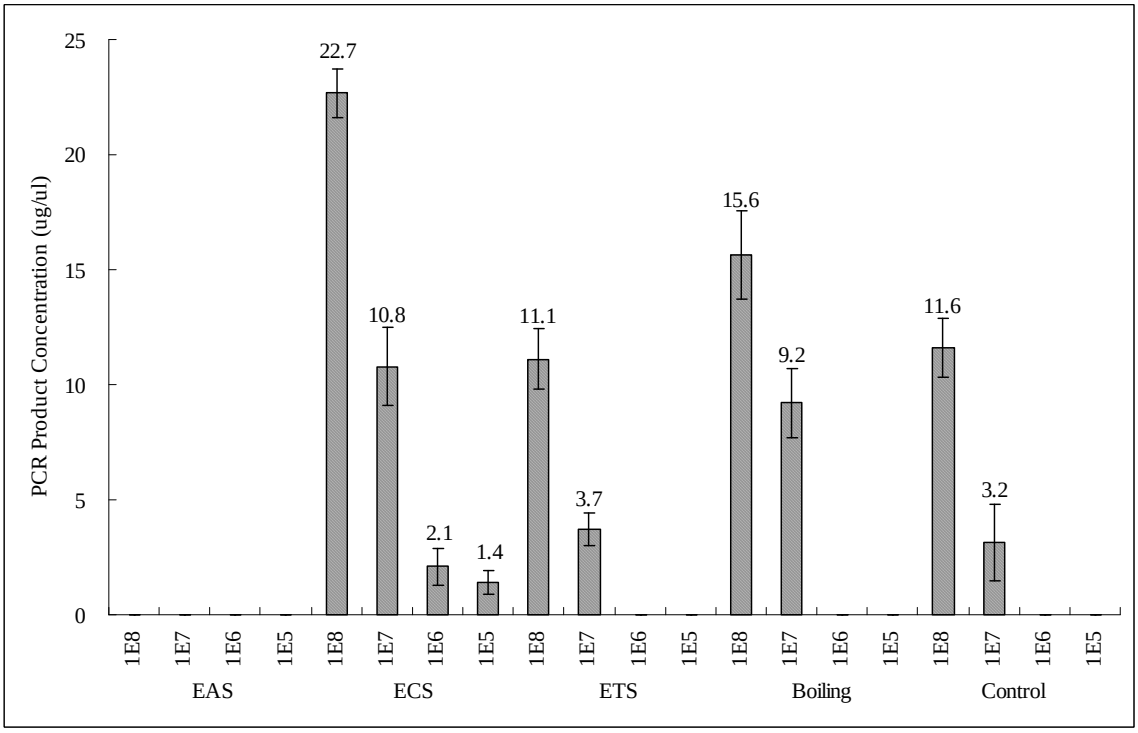
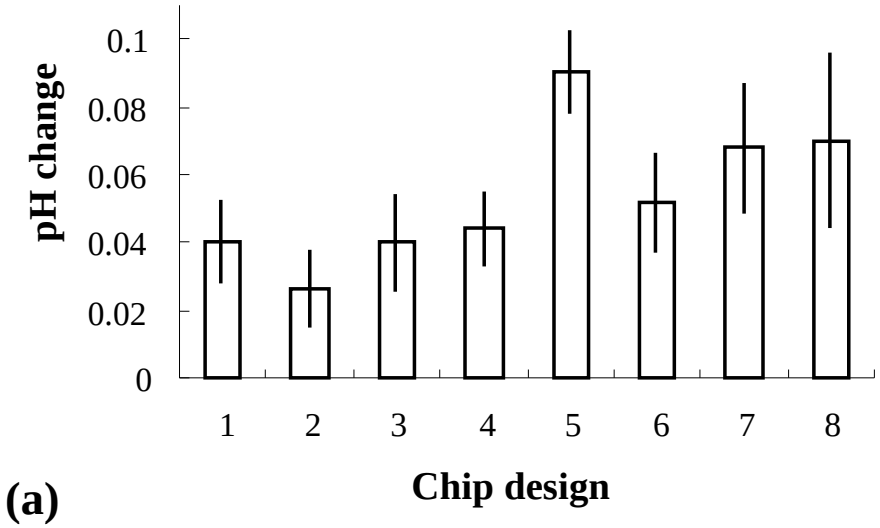
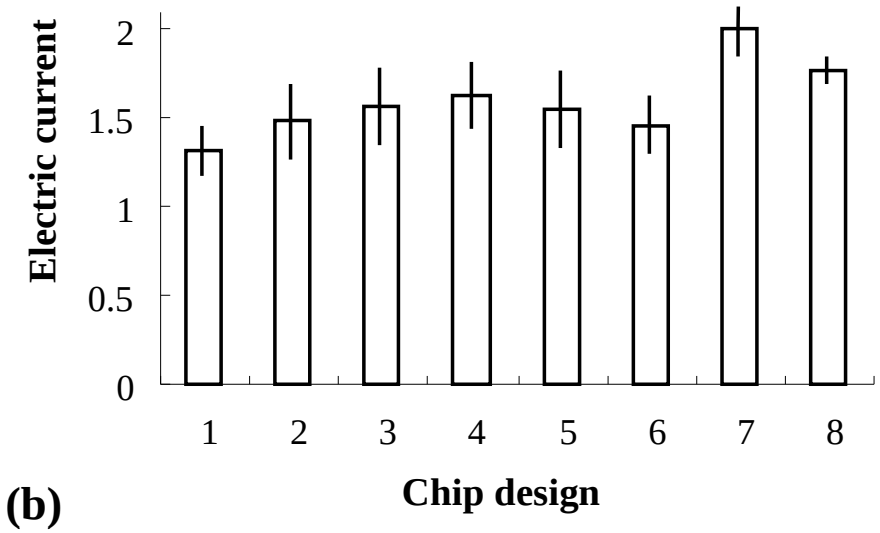


Fig. S5 Labchip analysis of PCR product concentrations from treated cells of various concentrations (10^8, 10^7, 10^6 and 10^5 cells/ml). Three repetitions were performed.



(a)

Fig. S6a Efficiency of pH maintenance in the cathode chamber. Three repetitions were performed.



(b)

Fig. S6b Electric current flow between the cathode and the anode chambers. Three repetitions were performed.