Electronic Supplementary Material (ESI) for Analytical Methods.

Point of Care Testing (POCT) of Cholesterol in Blood Serum via Moving Reaction Boundary Electrophoresis Titration Chip

Muhammad Idrees Khan,[a#] *Qiang Zhang,*[a#] *Yuli Tian,*[b] *Shah Saud,*[a] *Yiren Cao,*[a,c] *Jicun Ren,*[c] *Weiwen Liu,*[a,d] *and Chengxi Cao*[a,b,c,d]*

[a] *School of Sensing Science and Engineering, School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University, Shanghai 200240, China*

[b] *School of Life Sciences and Biotechnology, State Key Laboratory of Microbial Metabolism, Shanghai Jiao Tong University, Shanghai 200240, China*

[c] *School of Chemistry and Chemical Technology, Shanghai Jiao Tong University, Shanghai 200240, China*

[d] *Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Shanghai, China*

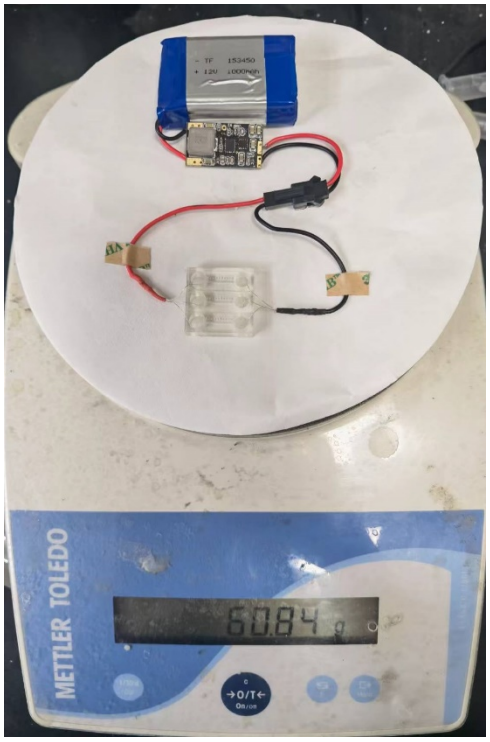

Fig. S1. Comprehensive photo of customized Lithium battery, integrated circuit and CHO ET Chip.

* The correspondent author: Prof. C. X. Cao (email: cxcao@sjtu.edu.cn).
# The first two authors have equal contribution to the work.

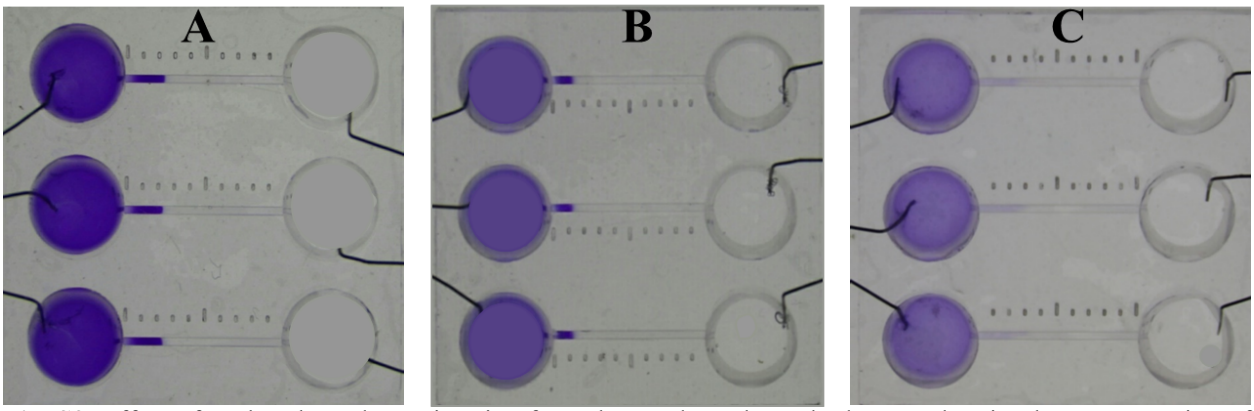

Fig. S2. Effect of KCl on boundary migration from the anode to the cathode. Note herein, the concentration of CHO concentration in Panel A was the same those in Panel B and C.

Effect of KCl on MRB Motion

To optimise the boundary movement from the cathode to the anode, various concentrations of KCl were used. During optimization experiments, it is very necessary to keep one substance constant, and the other should be increased or decreased, therefore, here we keep the concentration of the strong base sodium hydroxide constant in the agarose gel. To optimize the condition, we started from a low concentration of KCl such as 0.1 mM to higher concentration 200 mM KCl during CHO-ET titration. We noticed that when the concentration of KCl was very low inside the agarose gel of ET chip channel and anodic reservoir, the migration of ion movement was slow. **Fig. S2C** showed that when the concentration of base and KCl was same, e.g. 100 mM, the boundary formation was very slow, The boundary appearance takes more time as normal, and the boundary was observed after two or three-minute interval, not visible and not sharp.

However, as the concentration of KCl was increased, we noticed that the boundary movement appeared quickly from the anodic reservoir migrated towards the cathodic reservoir, the MRB was clear and sharp comparatively. In case of low and higher concentration of CV^{+} presence in the reservoir shown at **Fig. S1B and C**., The boundary migration was recorded after 2 min electrophoresis titration run. Therefore, finally, we choose 100 mM KCl,the optimized condition with 0.1 mM strong base in the agarose gel as background electrolyte as well as the cathodic reservoir. We also noticed that using a strong base in case of CHO-ET, the boundary was very sharp as shown in **Fig S.2** if the boundary is sharp, the real result obtained will be more accurate.