

Supplementary Information

Miniaturized Rapid Electrochemical Immunosensor Based on Screen Printed Carbon Electrodes for *Mycobacterium tuberculosis* Detection

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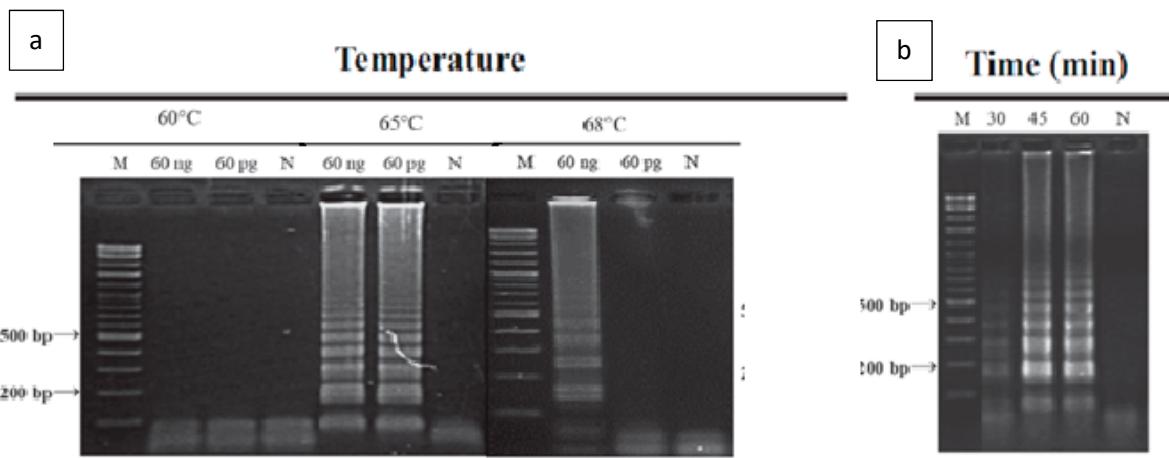


Figure S1. (a) Optimization of LAMP reaction temperature using 10-fold serially diluted Mtb-DNA as template. The reactions were carried out at different temperatures for 45 min.(b) Optimization of LAMP reaction time at the optimal temperature using various amounts of template.[1].

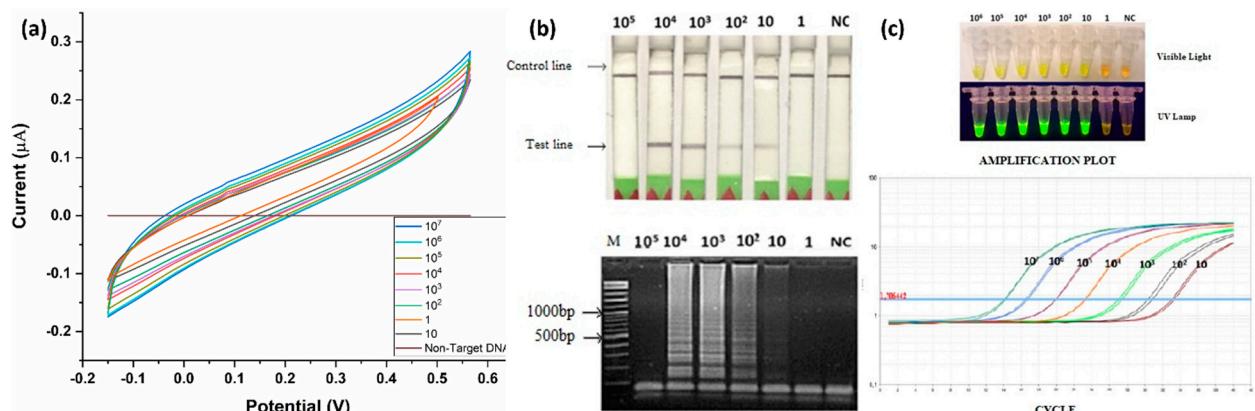


Figure S2. Detection sensitivity data of MTB genomic DNAs at concentration range of 10^{-1} to 10^{-6} dilutions obtained from (a) EC-LAMP, (b) LFD- LAMP, and (c) SS-LAMP. Lanes M and N represent DNA ladder marker and negative control (no-DNA template), respectively.

Table S1. Primer and probe sequences for the LAMP-EC biosensor-based assay.

Primer Name	IS6110 Gene Position	Sequence (5'-3')
F3 (FOP)	761-778	TCTCGTCCAGCGCCGCTT
B3 (BOP)	945-962	GCGGGTCCAGATGGCTTG
FIP (F1c-F2)	835-853/786-803	ACGTAGGCGAACCCCTGCC AGCACCTAACCGGCTG
BIP (B1c-B2)	861-879/922-939	GTCACCGACGCCTACGCTCTCG CGTCGAGGACCATGG
FLP	813-831	TCGACACATAAGGTGAGGTC
BLP	901-918	TCGCTTCCACGATGGCCA

Table S2. Specificity of LAMP-EC using the mini-potentiostat.

Group of Bacteria	Species/Strain of Bacteria	TB Status by LAMP-EC
Tuberculous Mycobacteria	Mycobacterium tuberculosis	+
	Mycobacterium bovis	+
Non-Tuberculous Mycobacteria	Mycobacterium avium	-
	Mycobacterium fortuitum	-
Non-Mycobacterial Species	Mycobacterium intracellulare	-
	Bacillus cereus BCC 6386	-
	Bacillus subtilis BCC 6327	-
	Enterococcus faecalis	-
	Enterobacter aerogenes DMST 1333	-
	Escherichia coli O157:H7 ATCC 35150	-
	Listeria innocua DMST 9011	-
	Listeria welshimeri DMST 20559	-
	Pseudomonas aeruginosa	-
	Salmonella typhimurium ATCC 13311	-
	Salmonella enteritidis ATCC 13076	-
	Salmonella infantis DMST 26426	-
	Staphylococcus epidermidis TISTR 518	-
	Vibrio cholerae O1, DMST 22115	-
	Vibrio parahaemolyticus ATCC 17802	-

References

1. Jaroenram, W.; Kampeera, J.; Arunrut, N.; Karuwan, C.; Sappat, A.; Khumwan, P.; Jaitrong, S.; Boonnak, K.; Prammananan, T.; Chaiprasert, A.; et al. Graphene-Based Electrochemical Genosensor Incorporated Loop-Mediated Isothermal Amplification for Rapid on-Site Detection of *Mycobacterium Tuberculosis*. *J. Pharm. Biomed. Anal.* **2020**, *186*, 113333, doi:10.1016/j.jpba.2020.113333.