

## ***An Integrated Paper-based Sample-to-Answer Biosensor for Nucleic Acid Testing at the Point of Care***

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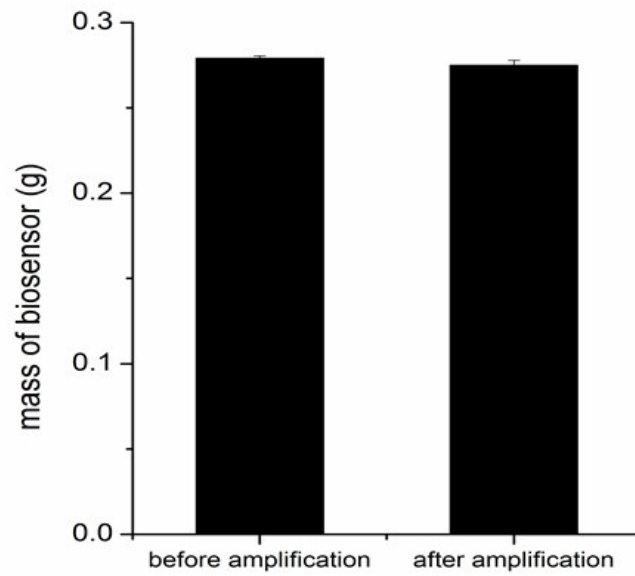
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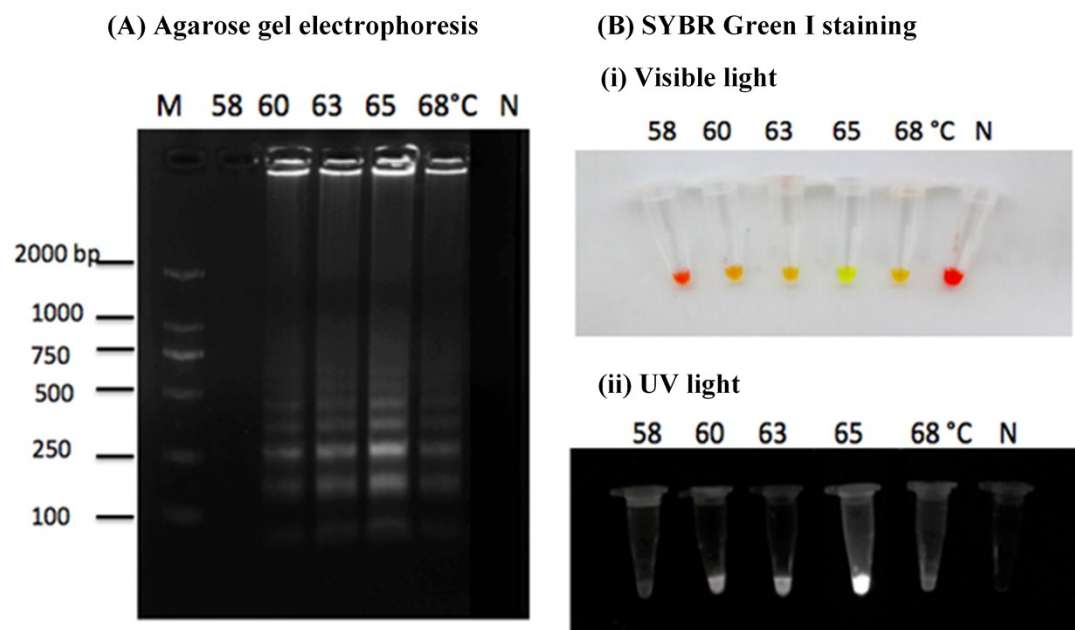
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**Figure S1. Evaluation of the risk of sample evaporation.** There was no significant difference observed between the mass of biosensor before and after LAMP at 65 °C, indicating no risk of sample evaporation.



**Figure S2. Optimization of paper-based LAMP temperature.** The LAMP temperature of 65 °C was the optimum paper-based LAMP temperature based on the visible bands in electrophoresis (A), the dense yellowish-green under visible light (B) and bright fluorescent signal under UV light (C) after SYBR Green I staining (N = negative control, M= 100-2000 bp marker).

**Supplementary Table 1. Oligonucleotide sequences used for LAMP**

<b>Name</b>	<b>Sequence (5'-3')</b>
<i>E.coli</i> detector probe	5'-caaagggagaagggcatgg -(CH <sub>2</sub> ) <sub>6</sub> -SH-3'
<i>E.coli</i> control probe	5'-ccatgcccttctcccttg /Biotin-3'
<i>E.coli</i> F3	5'-gccatctcctgatgacgc -3'
<i>E.coli</i> B3	5'-attaccgcagccagacg -3'
<i>E.coli</i> FIP	5'-Biotin/cattttgcagctgtacgctcgcagcccatcatgaatgttget -3'
<i>E.coli</i> BIP	5'-ctggggcgaggtcgtgtattccgacaacaccacgaatt -3'
<i>E.coli</i> FLP	5'-taacaacctgtcatcgac -3'
<i>E.coli</i> BLP	5'-atcaatctcgatatccatgaagtg -3'
<i>S.pneumonia</i> detector probe	5'- aaaacctaattctgggtctt -(CH <sub>2</sub> ) <sub>6</sub> -SH-3'
<i>S.pneumonia</i> control probe	5'- aagaccagaattaggttt /Biotin-3'
<i>S.pneumonia</i> F3	5'- gcgtgcaacatataaggcaa -3'
<i>S.pneumonia</i> B3	5'- agcattccaaccgcc -3'
<i>S.pneumonia</i> FIP	5'-Biotin/cgccagtgataatccgcttcacactcaactgggaatccgc -3'
<i>S.pneumonia</i> BIP	5'- tctcgacattgttgggaacggccaggcaccattatcaacagg -3'
<i>S.pneumonia</i> FLP	5'- ttctgtacggttgaat -3'
<i>S.pneumonia</i> BLP	5'- ttgcatcatgcaggttagga -3'

**Supplementary Table 2. Specifications of the handheld battery-powered heating device.**

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<b>Specifications</b>	
Size of the device (L ×W ×H)	7 cm ×12 cm ×11 cm
Weight of the device	500 g
Temperature range	RT +5 - 100 °C
Temperature accuracy	±0.1 °C
Power supply	220V ± 10% 50 Hz
Maximum voltage	50 W
Material of heating compartment	aluminum alloy
Material of non-heating compartment	polyformaldehyde
Battery life-span	10 hr

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