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

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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).
<table>
<thead>
<tr>
<th>Name</th>
<th>Sequence (5’-3’)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E.coli</em> detector probe</td>
<td>5’-caaaggagaagggcatgg -(CH₂)₆-SH-3’</td>
</tr>
<tr>
<td><em>E.coli</em> control probe</td>
<td>5’-ccatgcccttctccctttg /Biotin-3’</td>
</tr>
<tr>
<td><em>E.coli</em> F3</td>
<td>5’-gccatctctgtagcgc -3’</td>
</tr>
<tr>
<td><em>E.coli</em> B3</td>
<td>5’-atttaccgcagccagacg -3’</td>
</tr>
<tr>
<td><em>E.coli</em> FIP</td>
<td>5’-Biotin/ccattttgcagctgtacgctgcagccaccaatcatgaatgttgct -3’</td>
</tr>
<tr>
<td><em>E.coli</em> BIP</td>
<td>5’-ctggggcagaggtctgtttgccatccagaccaaaaccacgaatt -3’</td>
</tr>
<tr>
<td><em>E.coli</em> FLP</td>
<td>5’-taacacacttgtacagc -3’</td>
</tr>
<tr>
<td><em>E.coli</em> BLP</td>
<td>5’-atacaatctctagcatccaccaaggtg -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> detector probe</td>
<td>5’- aaaacctaattctgggtctt -(CH₂)₆-SH-3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> control probe</td>
<td>5’- aagacccagaatttggatt /Biotin-3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> F3</td>
<td>5’- gcgtgcaaccatatggccaa -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> B3</td>
<td>5’- agcgccagccagccaccaaggtg -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> FIP</td>
<td>5’-Biotin/cgcccgctacgaatccgcttcacactgaatggccgc -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> BIP</td>
<td>5’- ctctgcacattgttggcaacctgaactgggaatccg -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> FLP</td>
<td>5’- ttctgtaagggttaaat -3’</td>
</tr>
<tr>
<td><em>S.pneumonia</em> BLP</td>
<td>5’- ttgcatctgaggttaga -3’</td>
</tr>
</tbody>
</table>
Supplementary Table 2. Specifications of the handheld battery-powered heating device.

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