

## Supporting Information

# **An integrated passive micromixer-magnetic separation-capillary electrophoresis microdevice for rapid and multiplex pathogen detection at single-cell level**

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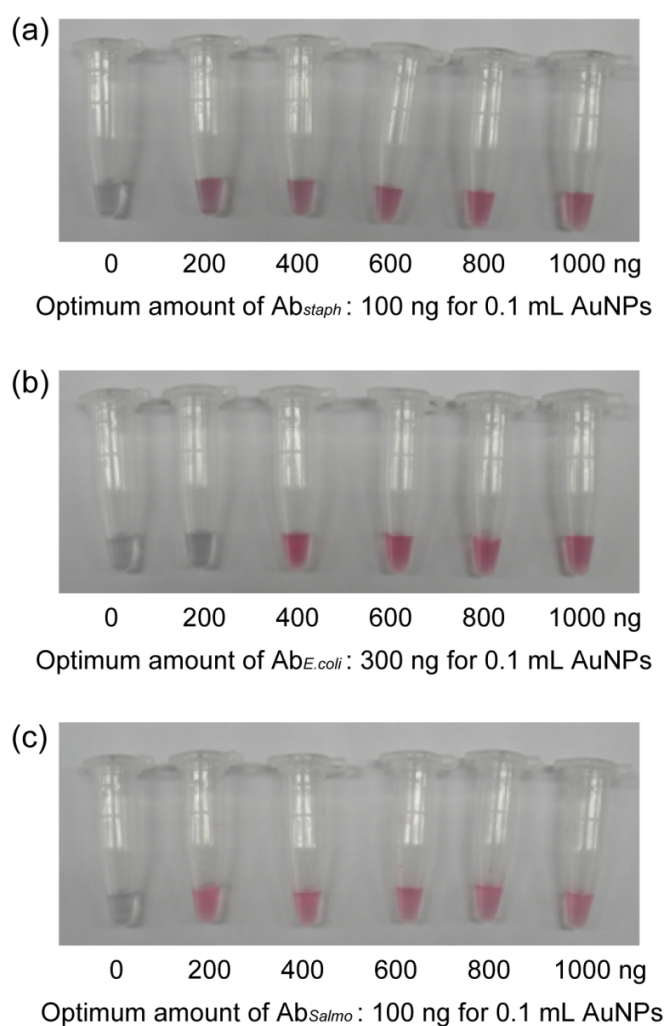


Figure S1. Optimum amount of antibody (Ab) for the conjugation with AuNP probes: (a) monoclonal anti-*Staphylococcus aureus*, (b) monoclonal anti-*E. coli* O157:H7, and (c) monoclonal anti-*Salmonella typhimurium*. It was performed according to the previously published literature.<sup>1</sup> The red-shift (i.e., purple) indicates the aggregation of AuNPs induced by NaCl (2 M, 10  $\mu$ L). This is a rough indicator for how much of the AuNP surface is available for thiolated barcode DNA binding. For example, in case of (a), the bare AuNPs were aggregated showing red-shift while the Ab conjugated-AuNPs were stable and no aggregation occurred. That means enough amount of Ab was immobilized on the AuNP surface to prevent the particle aggregation representing no enough surface area for thiolated barcode DNA strand binding.

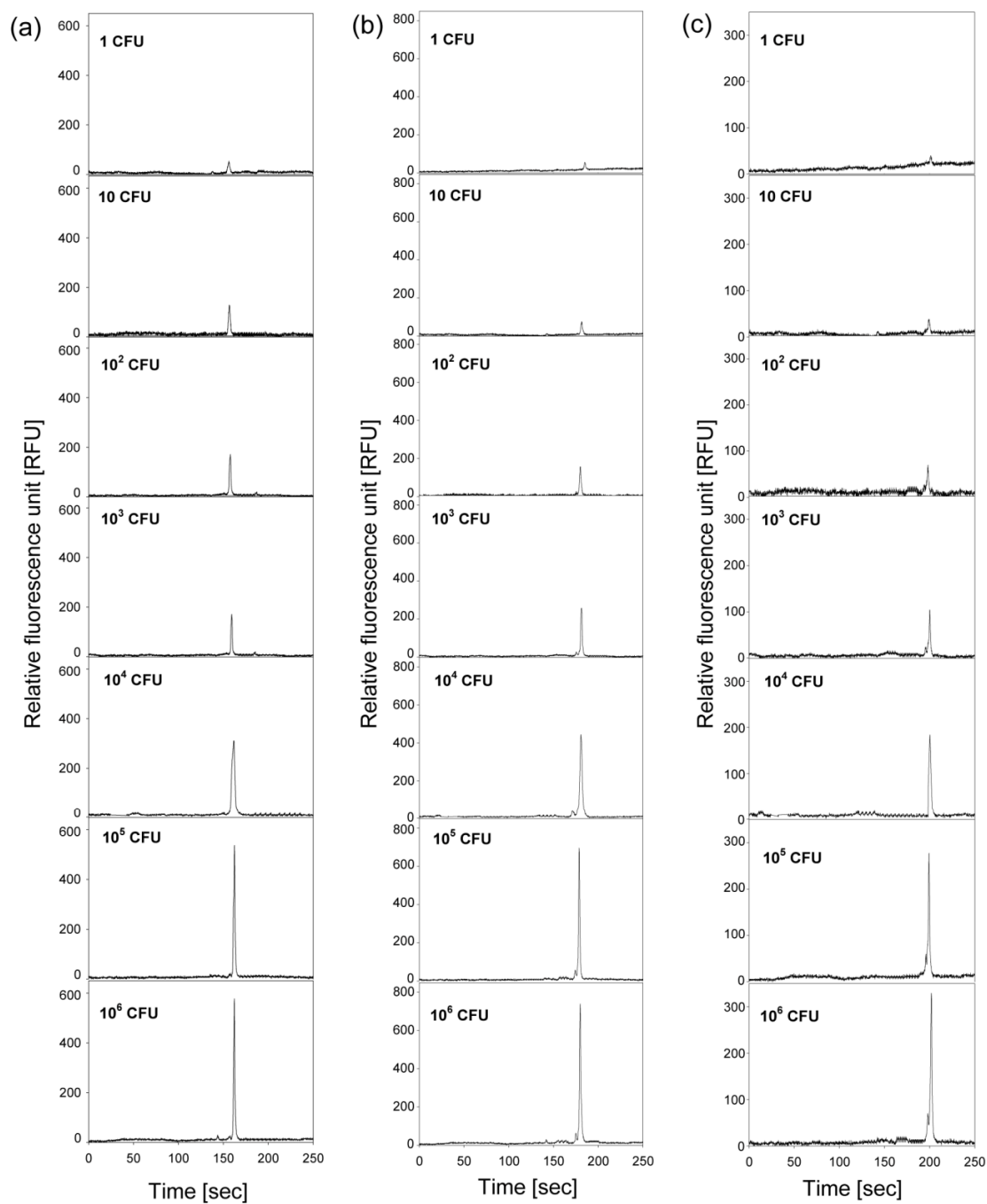


Figure S2. Electropherogram of monoplex pathogen detection: (a) *Staphylococcus aureus*, (b) *E. coli* O157:H7, and (c) *Salmonella typhimurium*.

Table S1. RFU values in the monoplex pathogen detection depending on the input cell number.

CFU	RFU of <i>Staphylococcus aureus</i>	RFU of <i>Escherichia coli</i> O157:H7	RFU of <i>Salmonella typhimurium</i>
1	31 ± 4.8	46 ± 6.2	11 ± 4.8
10	55 ± 12	77 ± 13	37 ± 9.7
10 <sup>2</sup>	109 ± 15	138 ± 17	56 ± 11.4
10 <sup>3</sup>	145 ± 9	231 ± 11	83 ± 21.5
10 <sup>4</sup>	274 ± 41	404 ± 38	142 ± 34.2
10 <sup>5</sup>	505 ± 26	667 ± 30	283 ± 28.9
10 <sup>6</sup>	565 ± 24	684 ± 28	301 ± 25.7

Table S2. Sigmoidal equations for the quantitative analysis of pathogens.

Targets	<i>Staphylococcus aureus</i>	<i>Escherichia coli</i> O157:H7	<i>Salmonella typhimurium</i>
Sigmoidal equation	$y = 53.07 + \frac{563.11}{1 + e^{-\frac{(x-15560.08)}{-0.62}}}$ <p>(R<sup>2</sup>=0.9899)</p>	$y = 62.18 + \frac{680.46}{1 + e^{-\frac{(x-7155.01)}{-0.59}}}$ <p>(R<sup>2</sup>=0.9897)</p>	$y = 41.55 + \frac{259.34}{1 + e^{-\frac{(x-12583.19)}{-1.1567}}}$ <p>(R<sup>2</sup>=0.9661)</p>

y: RFU and x: cell number

## Reference

- 1) H. D. Hill and C. A. Mirkin, *Nat. Prot.*, 2006, **1**, 324–336.