Supporting Information

Instrument-Free, Screen-Printed Paper Microfluidic Device That Enables Bio and Chemical Sensing

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Optimisation of pipetting volume

Because assay reagents are expensive, optimization of pipetting volume of solution into paper sample zones is important. Moreover, using a large volume of solution than the sample zones can contain can lead to cross contamination as a secondary problem. On the other hand, using a smaller volume of solution than the sample zones can contain can lead to miss-pipetting in multistep assays. 0.01 M fluorescein solution was traced using a fluorescence microscope as a model to investigate the optimum pipetting volume of solution in the sample zones. The investigation procedures included two simple steps: first different volumes of fluorescein solution (0.3-0.7 µL) were spotted in the sample zones and second, the fluorescence images of the sample zones were obtained with the fluorescence microscope. As shown in Figure S-1, 0.2, 0.3, and 0.4 µL volumes of the solution were not sufficient to fill all the sample zones. In addition for the reasons mentioned above, 0.6 and 0.7 µL volumes and more were not desirable.

From these results, we considered 0.5 µL as the optimum pipetting volume in a sample zone (Figure S-1).

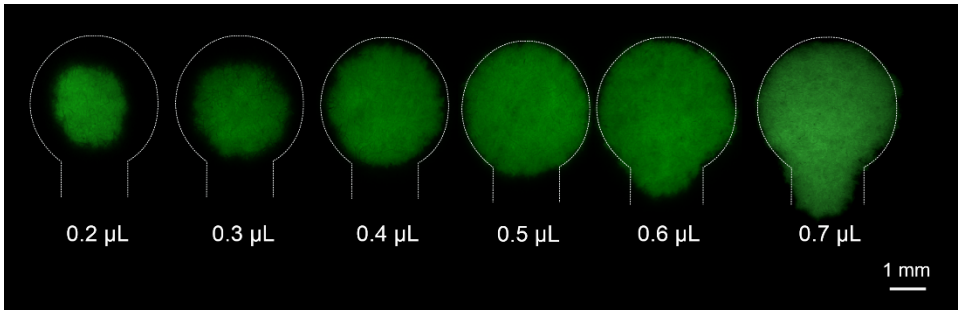

Figure S-1. *Optimisation of pipetting volume in sample zones and sufficiency of solution immobilization.*