Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary information

Tear-off patterning: Simple method for patterning nitrocellulose membranes to improve performance of point-of-care diagnostic biosensors

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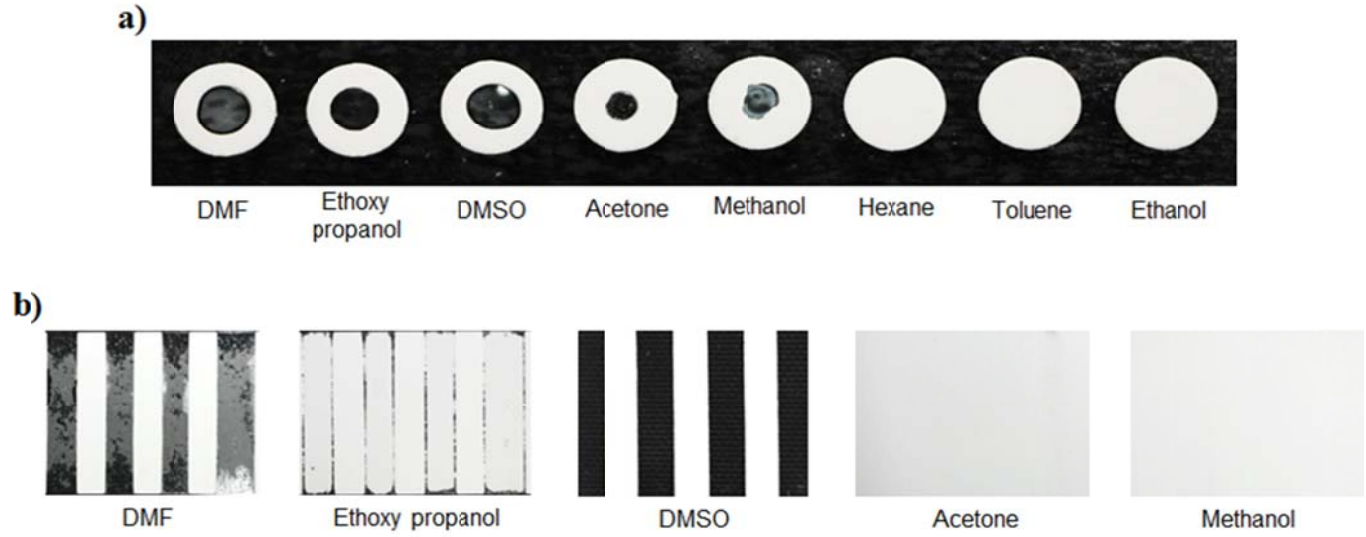

Figure S1. Screening of various organic solvents. a) Solubility of NC membranes in various solvents determined by dropping the solvent on an NC membrane, and b) compatibility screening performed by forming patterns using the organic solvents already tested for their ability to dissolve NC membranes.

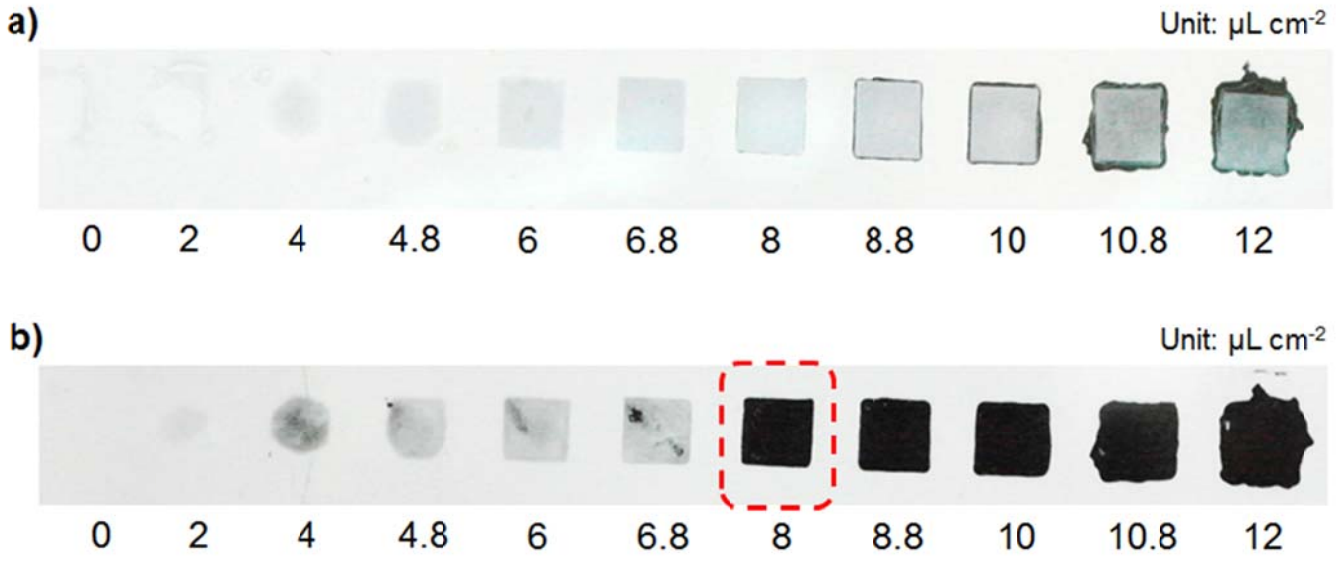

Figure S2. Comparison of patterning efficiency for different amounts of DMSO loaded in the a) stamping, and b) tearing-off steps.

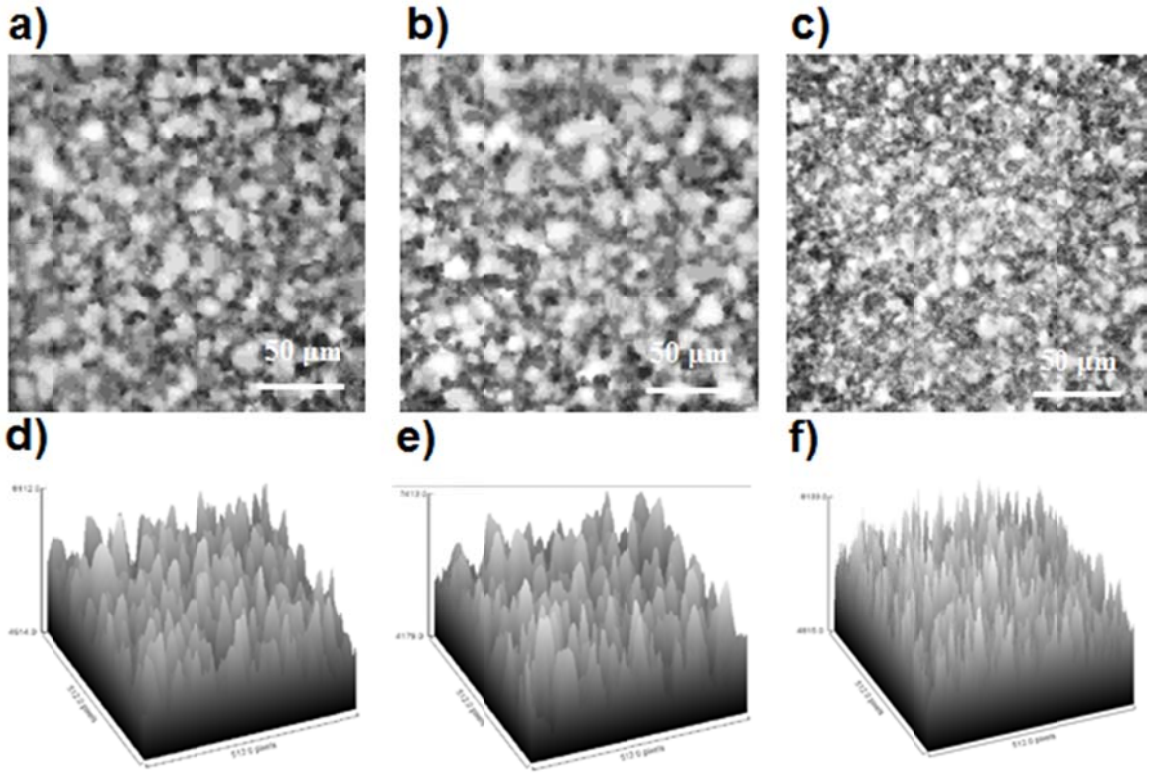

***Figure S3*.** a-c) Microscopic images and d-e) surface plots (obtained using the ImageJ software) of NC membranes. a) and d) show the bare NC membrane, b) and e) show the membrane patterned using tear-off patterning, and c) and f) show the thermal-printer-treated NC membrane.

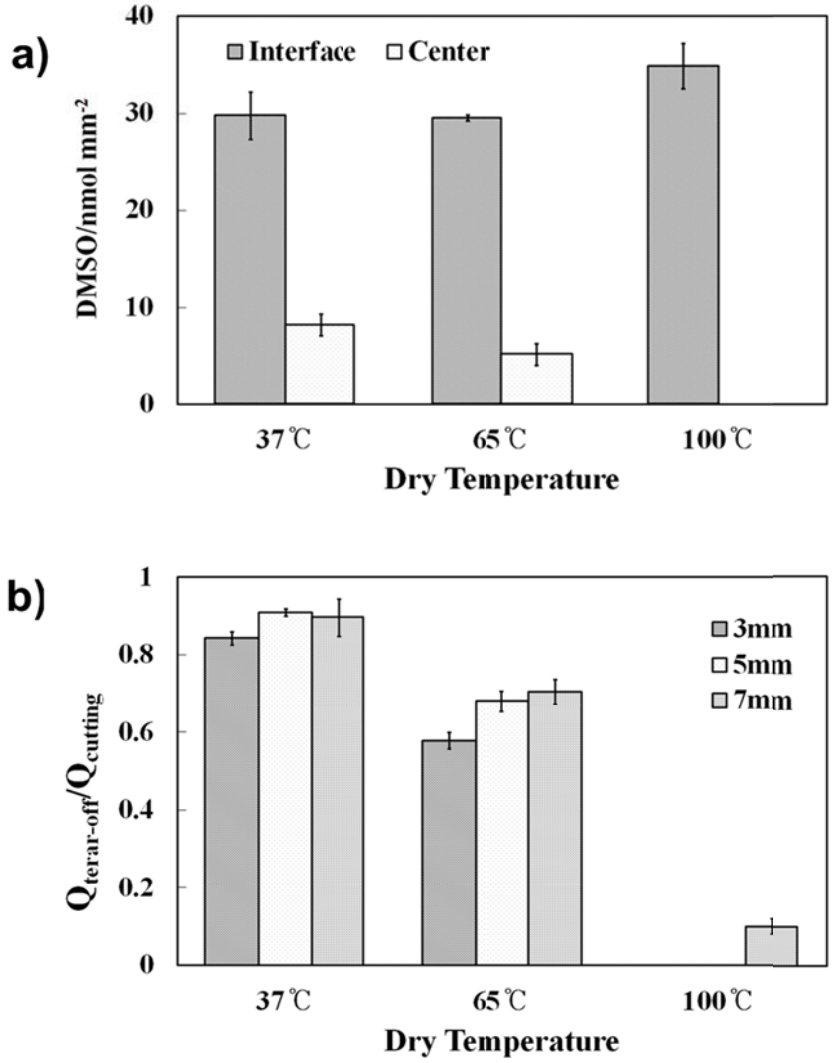

Figure S4. (a) The dependence of the residual DMSO quantities (nmol/mm^2) after patterning on dry temperature. (b) The dependence of the volumetric flow rate ratio on pattern width and dry temperature. Approximately 30 nmol mm^{-2} DMSO was detected at the interface, and this value corresponds to 2.11 nL mm^{-2}. The void volume of the NC membrane is 135 nL mm^{-2}. This implies that approximately 1.56% of the DMSO in mixed samples flows to the NC membrane initially, and the DMSO concentration will decrease rapidly over time due to a washing effect. The volumetric flow rate (Q) decreased significantly with increasing drying temperature. In particular, at temperatures above 100 ° C, the thermal damage to the NC membrane could be observed by the naked eye.

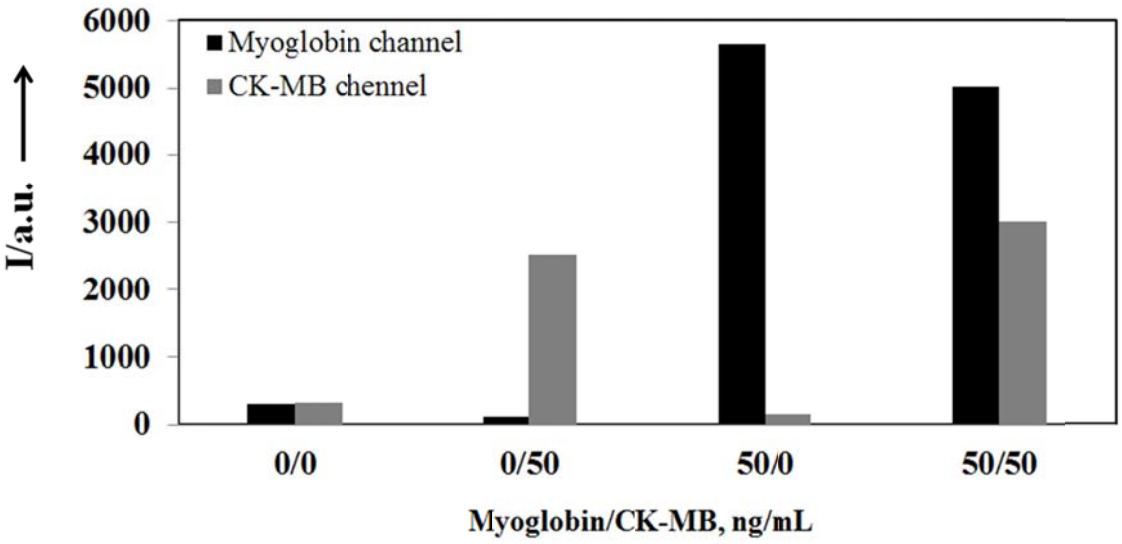

Figure S5. Check for cross-activity between the CK-MB and myoglobin antibodies.