Supporting Information

Laminated Paper-based Analytical Devices (LPAD): Fabrication, Characterization, and Assays

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S1. LPAD solvent compatibility

The test sections of LPAD were covered with 200 µL of acetone, methanol, cyclohexane, or water, and allowed to dry at room temperature until all solvents were evaporated. The devices were then visually examined for delamination, void formation, or changes in opacity. To test the mechanical stability after solvent treatment, transverse and longitudinal bending was applied to LPAD by folding the devices into semi-circles. The devices were further tested for leakage, delamination, or solvated material infiltration by applying 18 µL of 1 mM Coomassie Brilliant Blue R-250 to LPAD. We found that LPAD treated with organic solvents behaved similarly to the one treated with water, as shown in **Figure S1.** The results indicate that the organic solvent treatment had no impact on delamination, film transparency, or flow rate. Likewise, subjecting LPAD to axial and transverse bending after solvent treatment had undetectable effect.

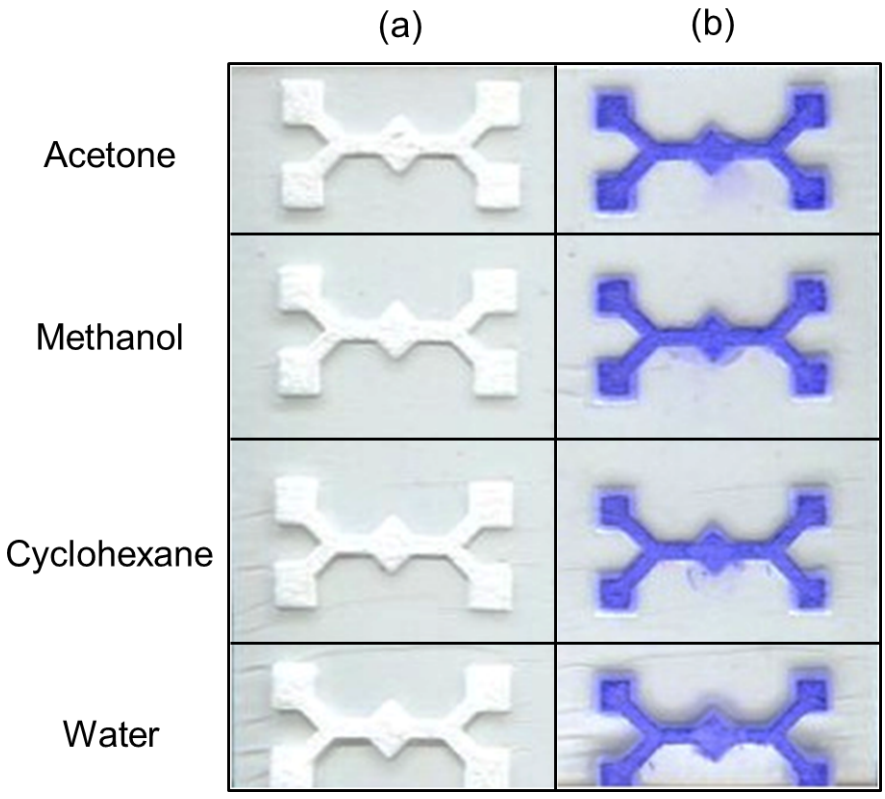


Figure S1. (a) Picture of LPAD devices after treatment with various solvents as well as axial and transverse bending. No significant difference is visible between the various LPAD. **(b)** Picture of the devices from (a) after application of Coomassie dye, illustrating an absence of leakage or delamination.

S2. Air gaps between lamination films and paper strips when improperly laminated

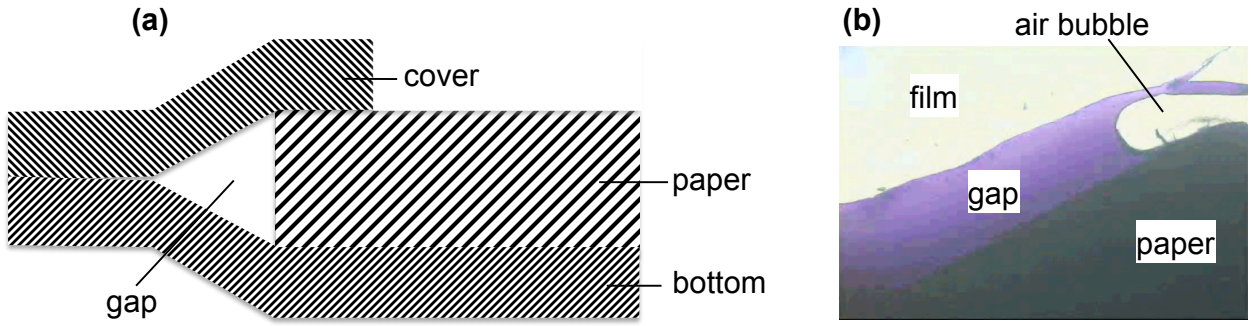
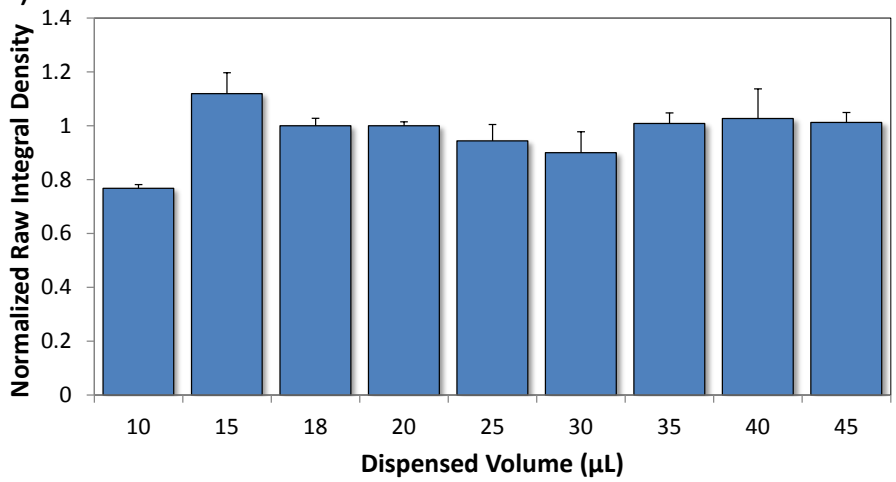


Figure S2. (a) Diagram illustrating an air gap between the cover layer and bottom substrate at the edge of a paper strip if LPAD is improperly laminated. Examples include an inadequate roller temperature that results in insufficient compliance of the lamination films. **(b)** Microscope image of a device with a gap, which functioned as a capillary when a dye solution was introduced into the device.

S3. Effects of the sample volume on glucose assay

(a)



(b)

Dispensed Volume	% Difference
10	6.56%
15	2.81%
20	0.00%
25	1.44%
30	2.63%
35	0.20%
40	0.67%
45	0.31%

Figure S3. (a) Signal intensities on LPAD for samples of 10 mM glucose with a volume ranging from 10 µL to 45 µL. The signal was normalized with respect to the signal of the 18 µL sample. The assay was performed as described in the Experimental Section. The large variation for the 10-µL sample is due to insufficient volume, indicated by the fact that the sample pad was dried before the completion of the assay. **(b)** The differences in percent with respect to the signal of the 18 µL.