SUPPLEMENTARY INFORMATION

Wax-printed fluidic controls for delaying and accelerating fluid transport on paper-based analytical devices

Maria Tarara[1], Dimosthenis L. Giokas[2], George Z. Tsogas[1,*]

[1]Laboratory of Analytical Chemistry, School of Chemistry, Faculty of Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece

[2]Laboratory of Analytical Chemistry, Department of Chemistry, University of Ioannina, 45110 Ioannina, Greece

[*] Correspondence. G.Z. Tsogas (gtsogkas@chem.auth.gr)

Video S1: Demonstration of the kinetic paper-based assay for the analysis of glucose.

Table S1. Fluid transport time and reaction time on paper devices used for the glucose assay.

Fluidic control	Fluid transport time (sec)	Reaction time on detection zone (sec)	Total analysis time (sec)
Engraved horizontal channel	25±2	113±8	138±5
2 overlaying layers	43±4	95±6	138±4
Regular channel	63±6	75±4	138±5
1 start barrier (0.035 mm width)	98±7	40±3	138±5

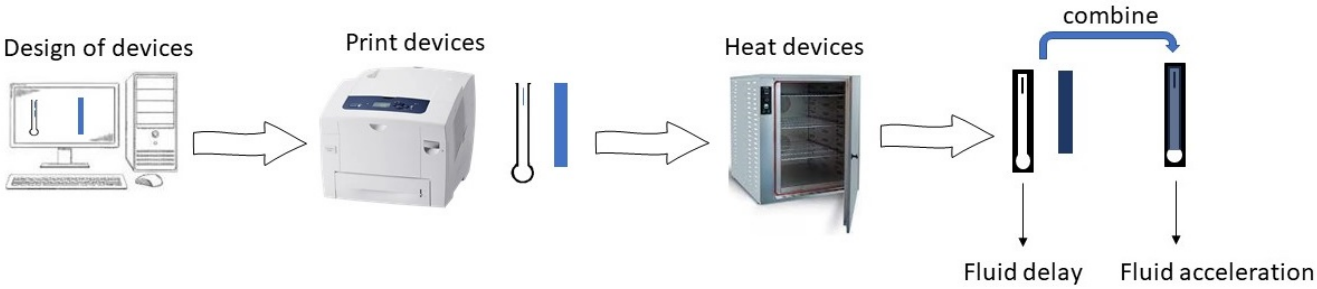

Figure S1. Schematic illustration of the procedure for preparing the devices.

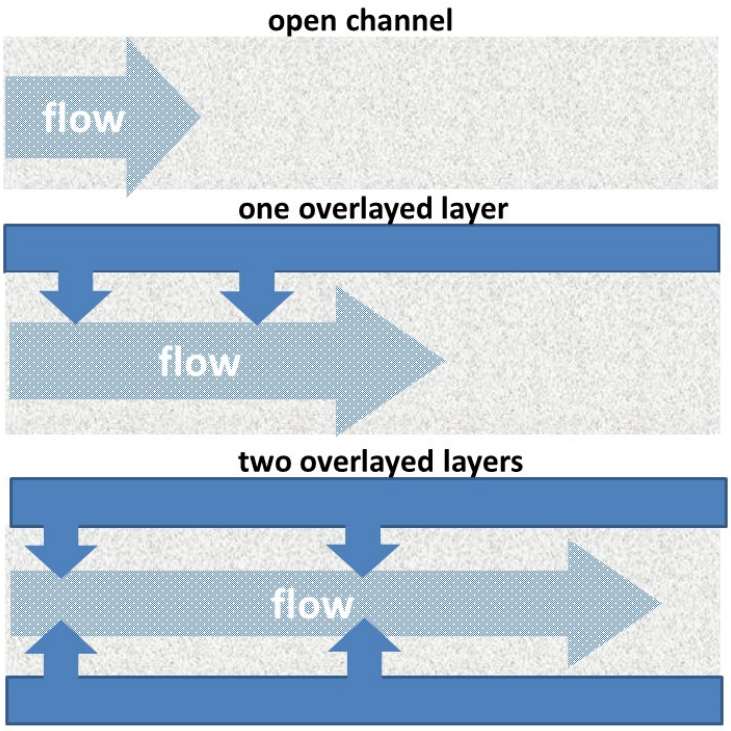

Figure S2. Conceptual diagram of hydrophobic forces on water that is responsible for increasing fluid rate on paper.

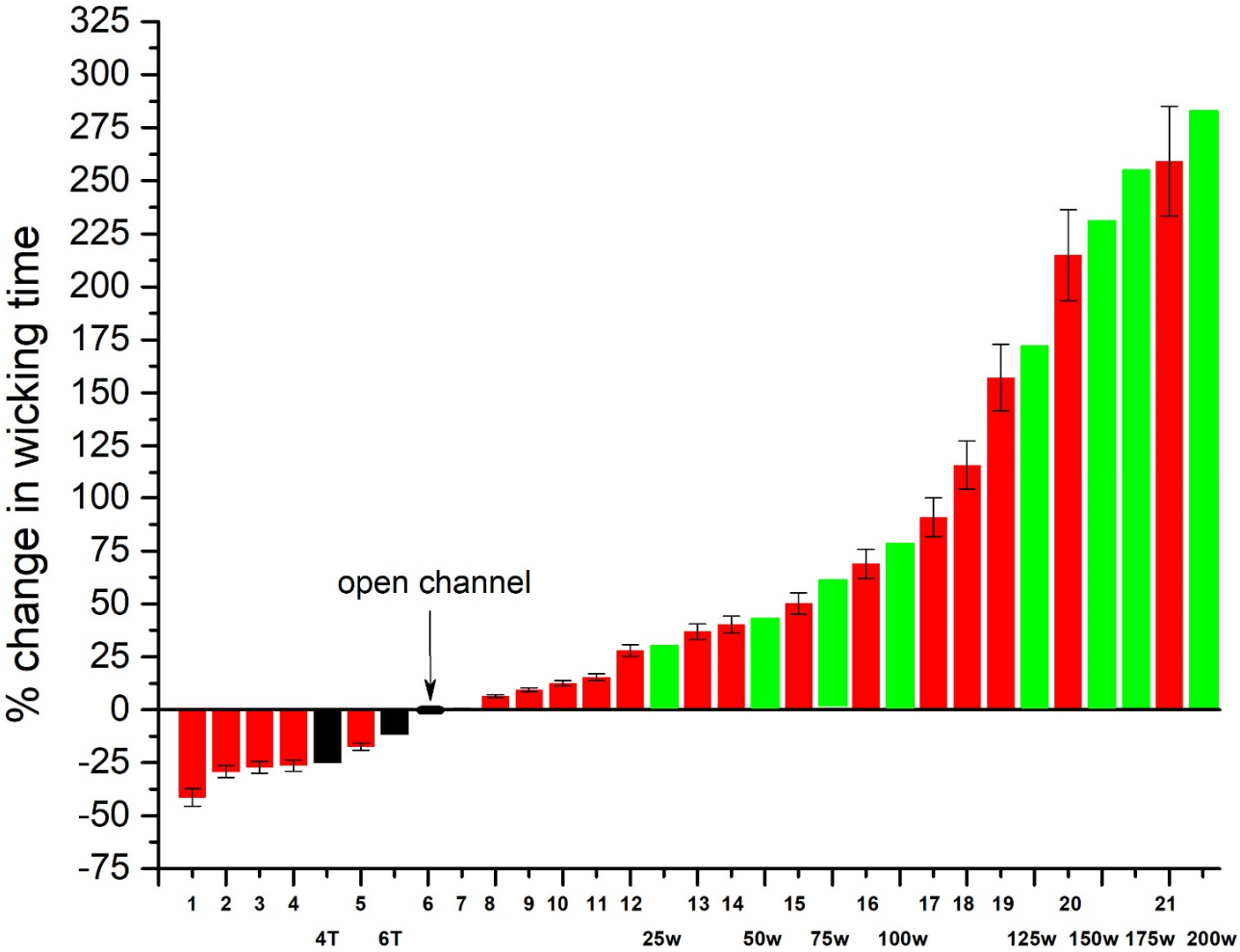

Figure S3. Change (% compared to open channels) in wicking times obtained by fluidic delays and accelerators (and combinations of them) as compared to fluid delays and accelerators prepared by other methods. The % change is calculated as the wicking time required for the fluid to travel a distance of 1 mm compared to the wicking time required for the fluid to travel a distance of 1 mm obtained in open channels. **1**: two overlaying layers, **2**: two overlaying layers with one end barrier of 0.035 mm width, **3**: two overlaying layers with one end barrier of 0.088 mm width, **4**: two overlaying layers with one end barrier of 0.175 mm width, **4T**: fully covered channel with 4 layers of toner, **5**: one overlaying layer, **6T**: fully covered channel with 6 layers of toner, **6**: regular (open) channel, **7**: two overlaying layers with two end barriers of 0.035 mm

width, **8**: one end barrier of 0.035 mm width, **9**: two overlaying layers with two end barriers of 0.088 mm width, **10**: two overlaying layers with two end barriers of 0.175 mm width, **11**: two end barriers of 0.035 mm width, **12**: one end barrier of 0.088 mm width, **25w**: channels with 25% wax covered (not melted), **13**: one end barrier of 0.175 mm width, **14**: one start barrier of 0.035 mm width, **50w**: channels with 50% wax covered (not melted), **15**: two end barriers of 0.088 mm width, **75w**: channels with 75% wax covered (not melted), **16**: two end barriers of 0.175 mm width, **100w**: channels with 100% wax covered (not melted), **17**: two start barriers of 0.035 mm width, **18**: one start barrier of 0.088 mm width, **19**: two start barriers of 0.088 mm width, **125w**: channels with 125% wax covered (not melted), **20**: one end barrier of 0.088 mm width, 1**50w**: channels with 150% wax covered (not melted), **175w**: channels with 175% wax covered (not melted), **21**: two start barriers of 0.175 mm width, **200w**: channels with 200% wax covered (not melted).

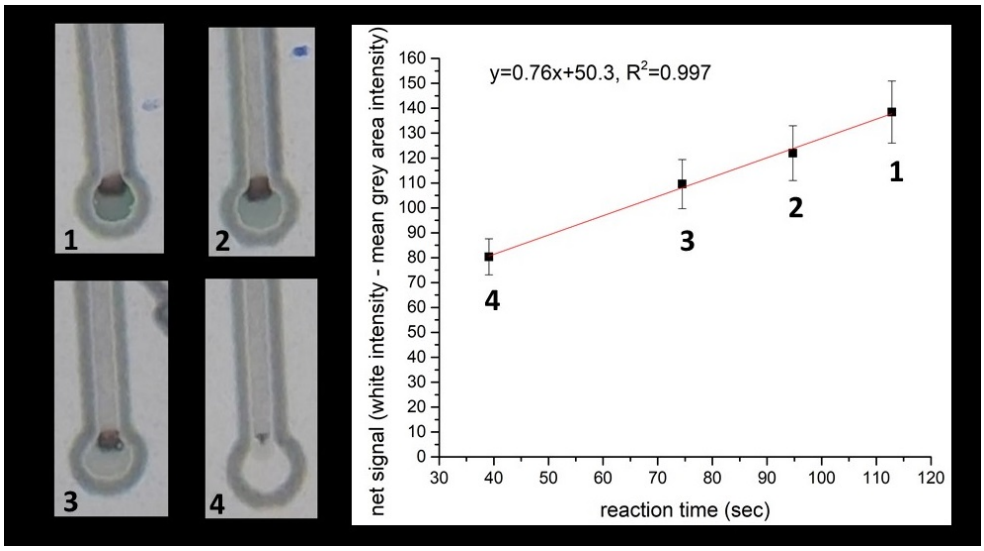

Figure S4. Kinetic determination of glucose on paper-based devices using programmable fluid delivery time.