

Supporting Information

A composite lateral flow test substrate by capillary deposition of cellulose on synthetic paper

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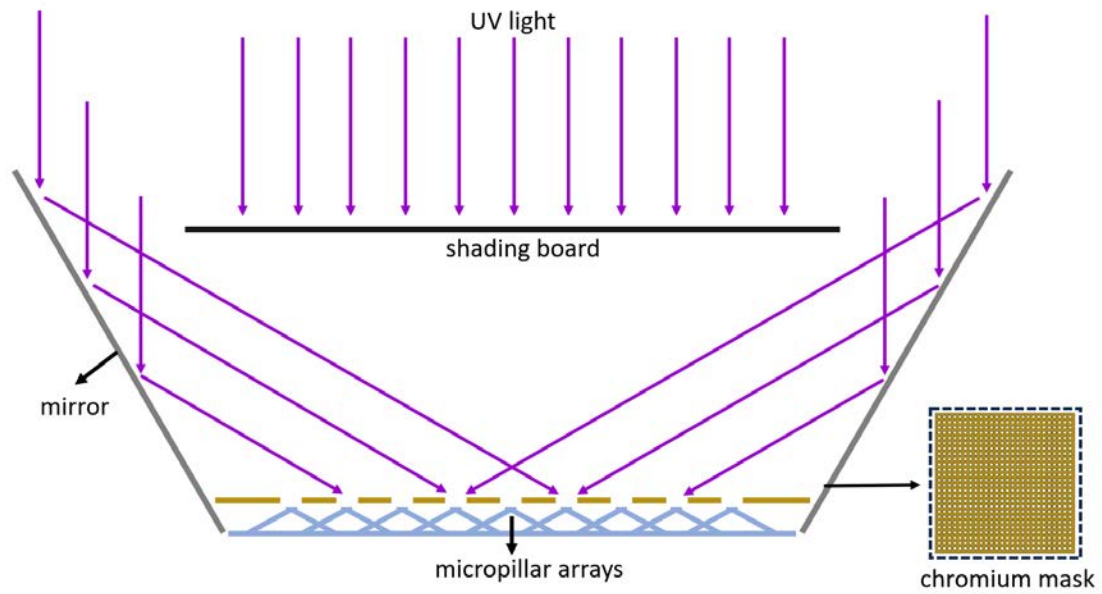


Figure S1 The fabrication of micropillar array. The angle of tilted aluminium mirror is 75° . The shading board blocks the UV light. The UV light is reflected by the mirror. The OSTE is lithographed through the chromium mask and forms the micropillar array.

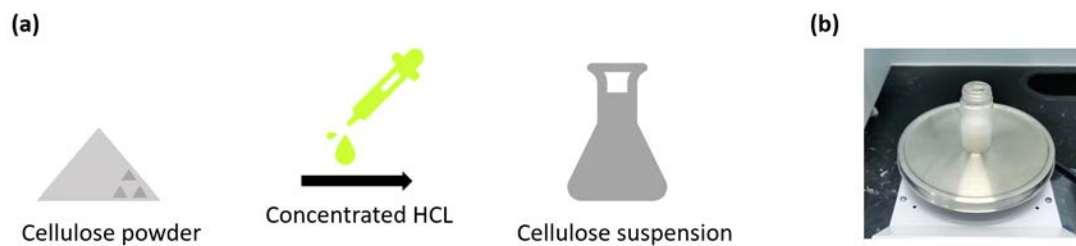


Figure S2 Cellulose dissolution. Cellulose is treated with concentrated hydrochloric acid. 10 mL 37 % hydrochloric acid is poured into 1 g microcrystalline cellulose. We stir the mixture at room temperature for 2 hours. Then, we use DI water for dialysis until the pH value changes to 7.0. The neutral cellulose suspension is poured into a glass bottle for storage before use.

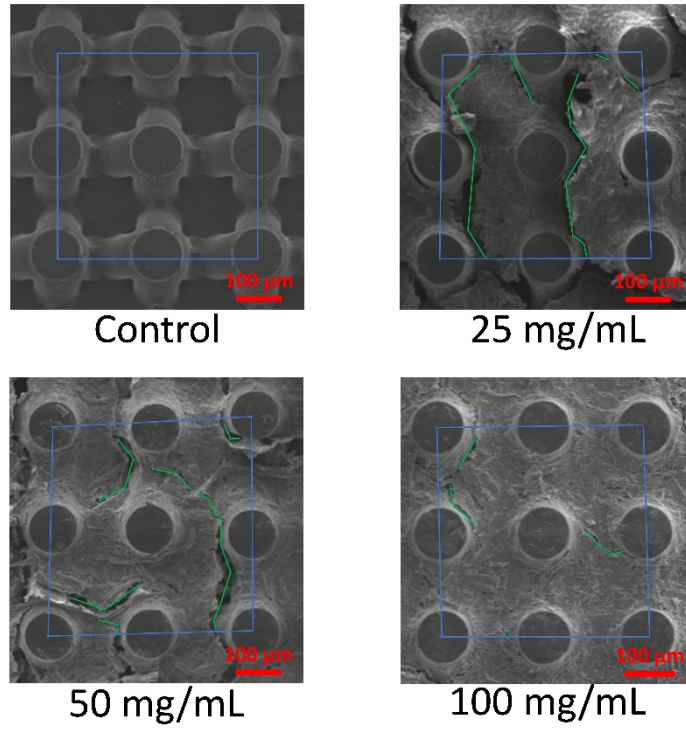


Figure S3 The average crack lengths are 0 (control), 1077.87 μm , 896.89 μm and 303.48 μm respectively.

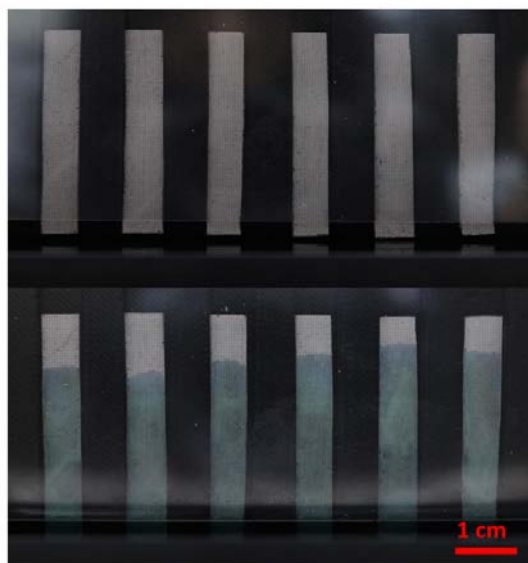


Figure S4 The pictures of test strips before and after green water flows on them.

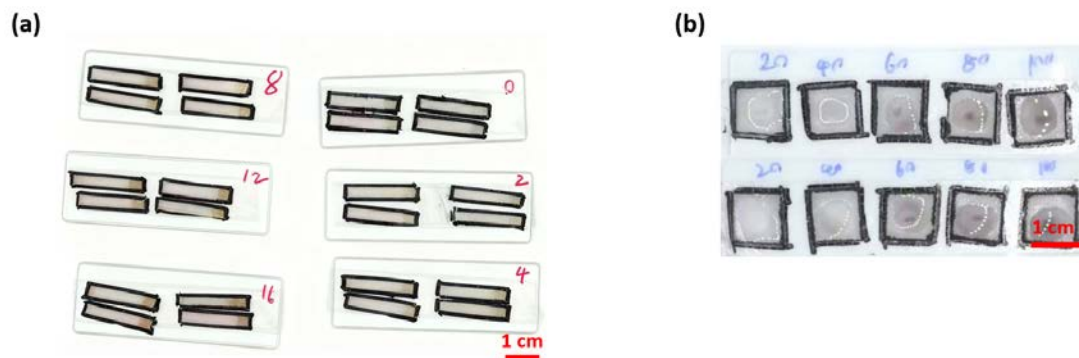


Figure S5 Detection of urine glucose and iodate. (a) shows different brown depositions under different concentrations of urine glucose (0 mM, 2 mM, 4 mM, 8 mM, 12 mM and 16 mM). (b) shows different blue-purple depositions under different concentrations of iodate (20 mg/mL, 40 mg/mL, 60 mg/mL, 80 mg/mL and 100 mg/mL).

Plasma separation on nitrocellulose membrane

By implementing the same agglutination-based plasma separation strategy, plasma separation experiments are done on the commercial nitrocellulose membrane (NC140C, Cobetter) as a control experiment. The plasma on the nitrocellulose membrane isn't completely separated, and blood cells even spread from the reaction zone into the plasma channel (Figure S6(b)).

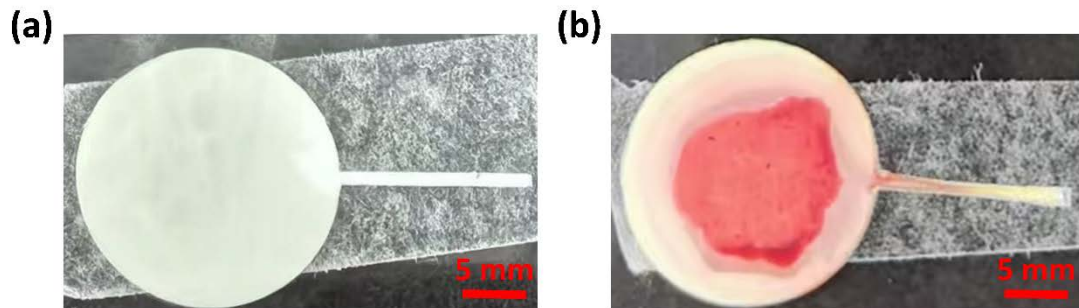


Figure S6 Plasma separation on nitrocellulose membrane: a test strip by nitrocellulose membrane before (a) and after (b) adding whole blood