Cloth-based microfluidic devices integrated onto the patch as wearable colorimetric sensors for simultaneous sweat analysis

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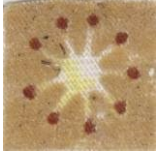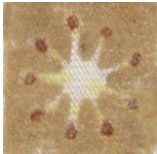
Table S1. Supplementary data of the CMD color change toward the lactic acid concentrations (0-1050 µg/mL)
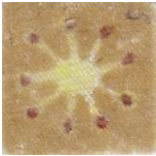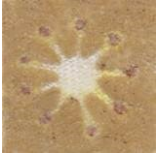
Analyte (µg/mL)	CMD	Mean RGB (n=9)	Δ RGB*
0		192,51±0,35	-
105		186,14±1,32	6,37
210		183,73±0,48	8,78
315		180,48±0,49	12,03
420		178,68±1,36	13,83

525		175,44±1,18	17,07
630		172,69±1,21	19,81
735		168,12±1,34	24,39
1050		159,56±1,97	32,94

*Δ RGB = Mean RGB Blank - Mean RGB analyte.

Table S2. Supplementary data of the CMD color change toward the sodium ion concentrations (0-3000 μg/mL)

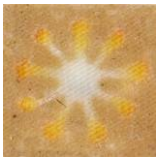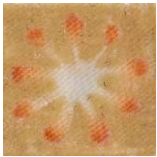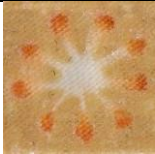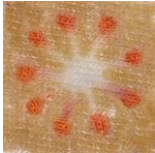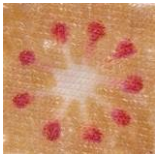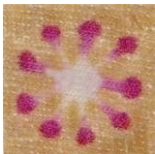| Analyte (μg/mL)	CMD	Mean RGB (n=9)	Δ RGB*
0		73,71±1,68	-
900		116,35±0,43	42,64
1000		117,75±0,97	44,04

1500		127,85±0,55	54,14
2000		135,37±0,49	61,66
2500		146,76±0,66	73,05
3000		156,46±1,68	82,75

*Δ RGB = Mean RGB Standard - Mean RGB Blanko

Table S3. Supplementary data of the CMD color change toward pH (4-7)

pH	Gambar	Mean RGB (n=9)	Δ RGB*
Before reacted		143,09±1,94	-
4		141,31±1,72	1,78
5		127,78±0,95	15,31

5,5		119,36±0,68	23,73
6		110,92±1,67	32,16
6,5		104,71±1,18	38,38
7		99,90±1,97	43,18

*Δ RGB = Mean RGB Blank - Mean RGB analyte.

Fig. S1. (a) Front View of a CMD with 20X Magnification (b) Front View of a CMD with 400X Magnification (c) Side View of a Cotton Shirt with 20X Magnification.
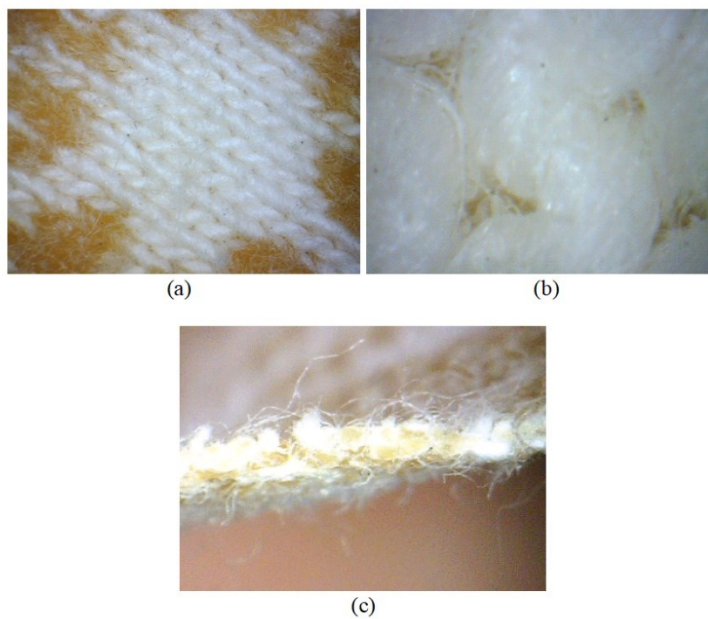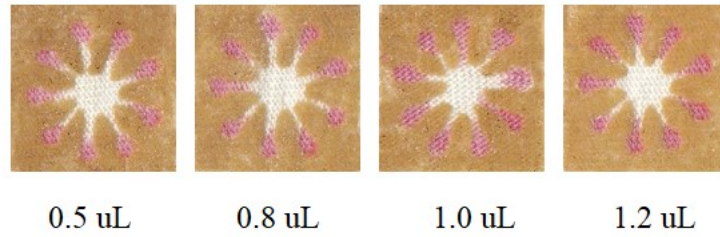
0.5 uL   0.8 uL   1.0 uL   1.2 uL

Fig. S2. The volume that can be accommodated in the sensing zone (0.5 -1.2 μL)

The Ringlight LED Clip-On for Smartphone to support a reproducible and stable color image using a smartphone camera.

Color Grab 3.6.1 (Loomatix®) to pick up the color using yellow circle

Then RGB value was produced by averaging the value of (RGB) (154, 83, 64)

Sepia   //Brown:Red

RGB: (154, 83, 64)   #9A5340

HSV: (13°, 58%, 60%)

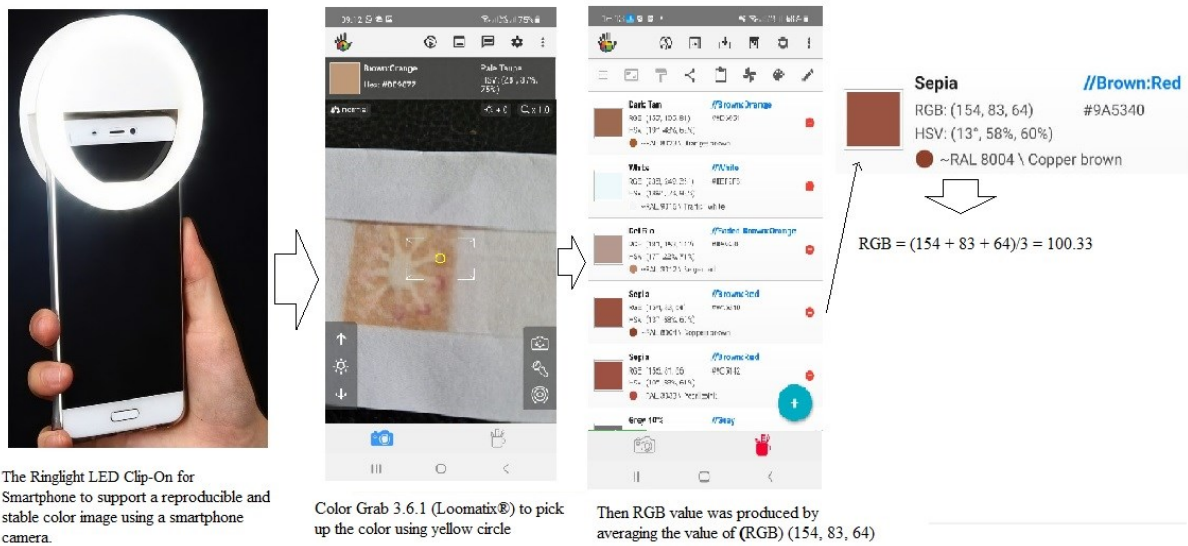~RAL 8004 \ Copper brown

RGB = (154 + 83 + 64)/3 = 100.33

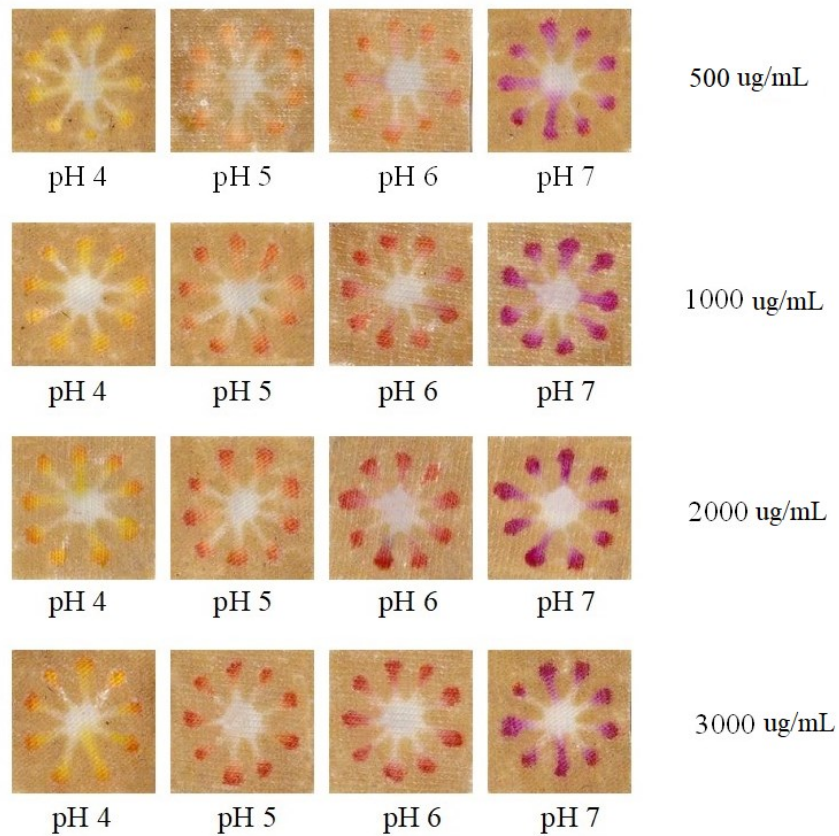Fig. S3. The set-up for taking pictures, and the mobile application for producing RGB value.

Fig. S4. The optimization of CPR concentrations as a pH indicator, wherein in this case 2000 µg/ml was found to be optimum and selected for further use.
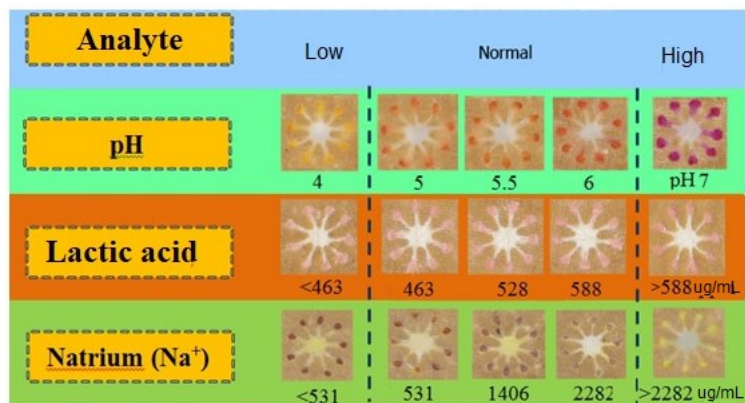

Fig. S5. The validated color reader was based on the CMDs color produced toward various target analyte concentrations (pH, lactic acid, and sodium ions).