

Electronic supplementary material (ESI) for Lab on a Chip.

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Table S1 Complete bill of materials.

Part	Material	Part Number	Source
General patch assembly	Microfluidic diagnostic transparent tape	9964	3M
	Polyester spunlace nonwoven adhesive tape	4076	3M
	Double sided transparent polyethylene tape	1522	3M
	Wick material of rayon	NA	Eccrine
Hydrogel	Super absorbent polymer	ST-250*	Newstone
	Poly (vin alcohol)	363146	Sigma-Aldrich
	Blue colorant	450C	Cabot
	Plastic sheet	NA	Grafix
Sensor characterization	Sodium chloride	S9888	Sigma-Aldrich
	Sodium hydroxide	S5881	Sigma-Aldrich
	Hydrochloric acid	320331	Sigma-Aldrich

Table S2 Layer identification, material and purpose for patch fabrication

Layer code	Layer Name	Material	Part Number	Source	Purpose
A1	Shield	Plastic adhesive tape	9964	3M	prevent evaporation of water and contamination of the hydrogel from external water/sweat
B1	Sensor	Hydrogel	NA	NA	Swell up for total sweat volume detection
B2	Wick layer	Rayon	NA	WPT	Provide a wicking contact to the entire collection area
C1	Double adhesive layer	and	1522	3M	Adhere shield, wick layer, and single adhesive layer.
C2	Single adhesive layer	Non-woven single adhesive tape	4076	3M	Adhere patch to skin and provide seal ring position.
D1	Seal ring	Hydrogel	NA	NA	To ensure a well-defined sweat collection area under the patch
D2	Seal ring cover	Rayon	NA	WPT	Collect sweat to ensure a well-defined sweat collection area

Table S3 VLS3.50 Laser Settings for Patch Layer

Layer code	Color	Mode	Power (%)	Speed (%)
A1	Red	Vect	15	100
	Green	Vect	30	24
	Yellow	Vect	30	20
B1, D1	Red	Vect	18	100
B2, D2	Red	Vect	25	100
C1, C2	Red	Vect	6.5	23
	Green	Vect	5	24
	Yellow	Vect	11	24