

Figure S1. The porous PDMS layers, mixed with the citric acid and spin-coated at the different spin coating rpm of (a) 1,000; (b) 2,000; (c) 4,000 on the silicon wafer.

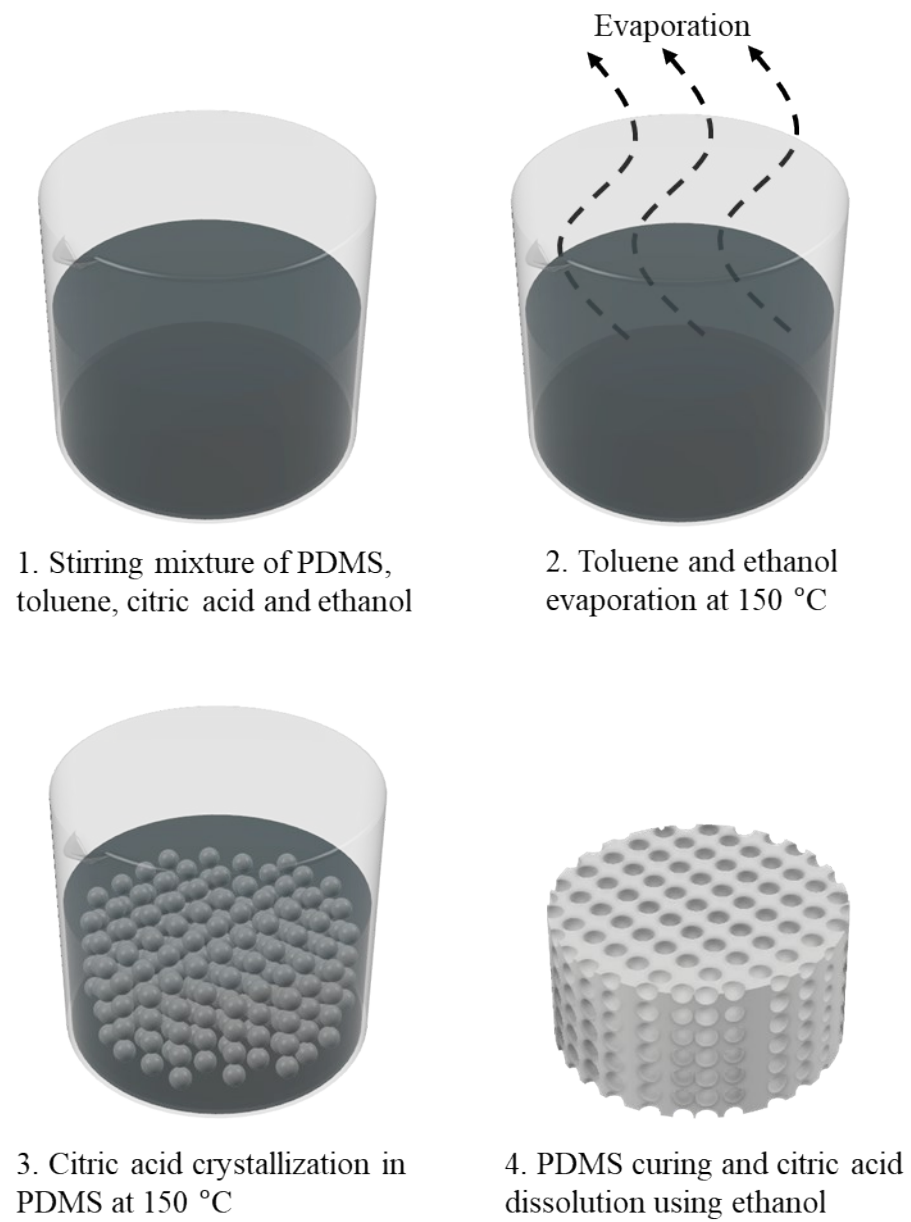


Figure S2. Fabrication process of the porous PDMS layers.

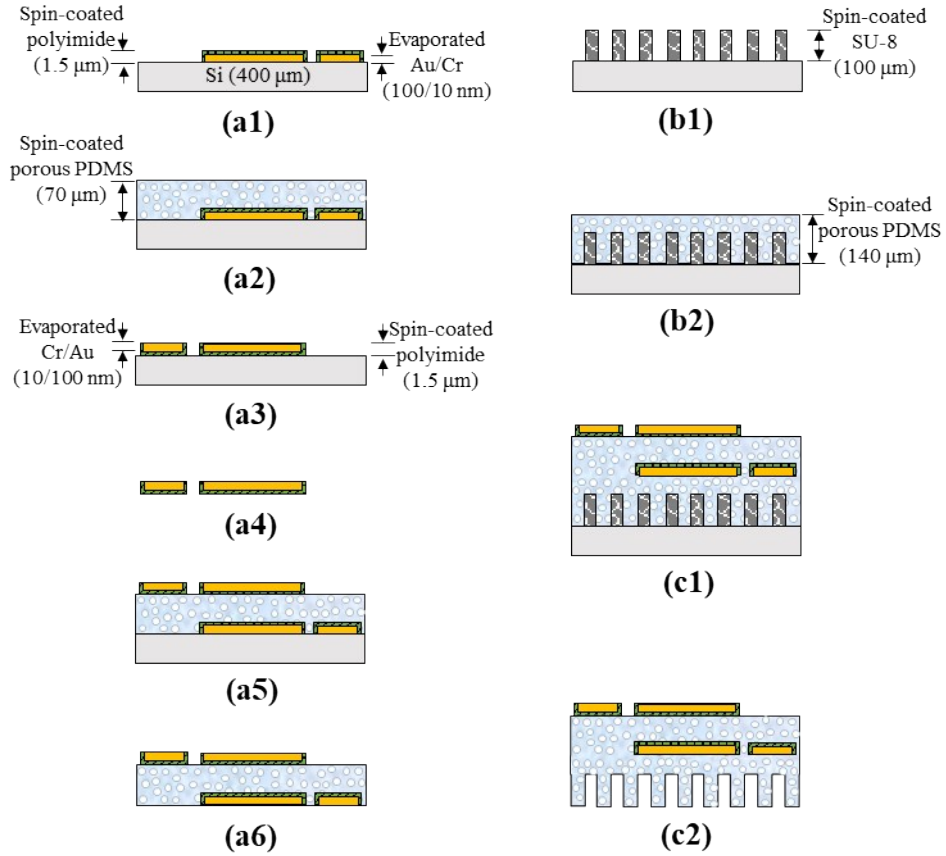


Figure S3. Fabrication process of the porous PDMS pulsewave sensor with haircell structures: (a1-a6) Fabrication process for the pulsewave sensor; (b1-b2) Polymer molding process for the haircell structures; (c1-c2) Assembly of the pulsewave sensor (a6) and the haircell structures (b2), followed by SU8 mold removal.

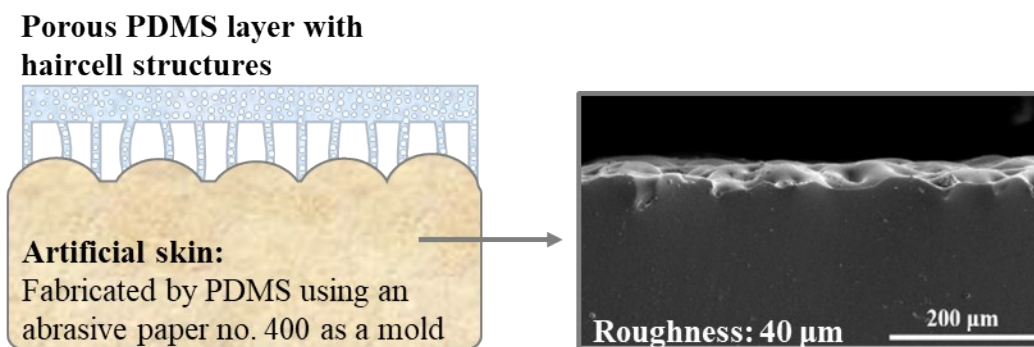


Figure S4. Experimental set-up for the contact area measurement, where the porous PDMS layer with the haircell structures is touched on the artificial skin, whose surfaces are shown in the right-side optical microscope image.

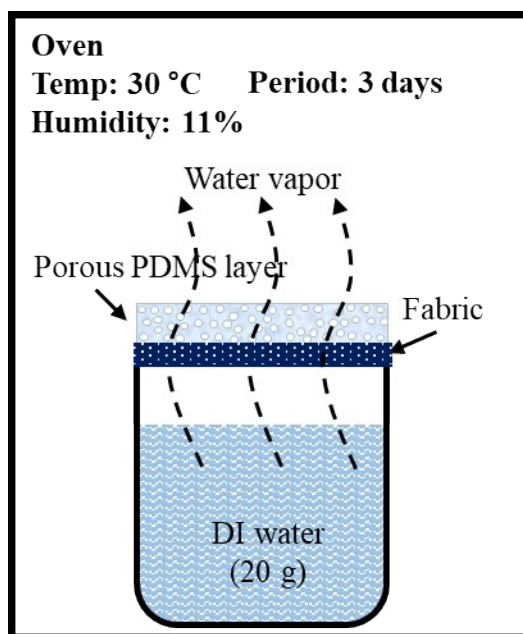


Figure S5. Experimental set-up for the water vapor transmission rate measurement for the porous PDMS layers.

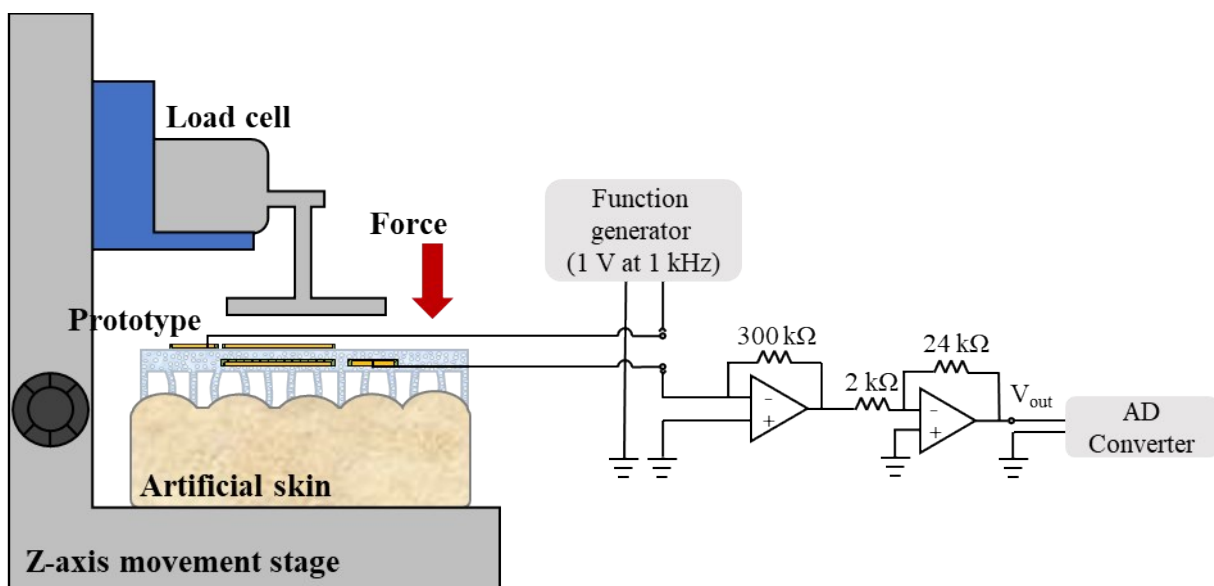


Figure S6. Experimental set-up for the prototype characterization, described in Results and Discussion.

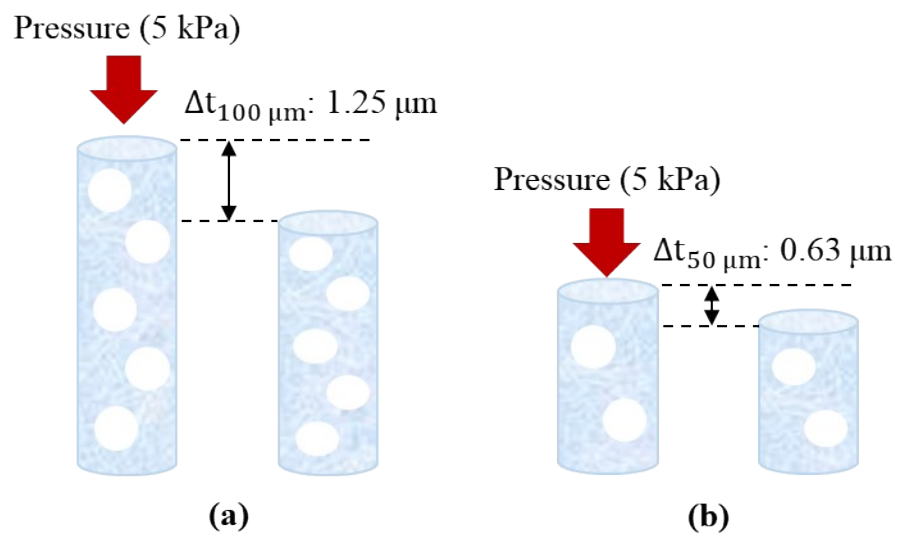


Figure S7. Deformation of the porous PDMS haircells at the pressure of 5 kPa, depending on the haircell heights of (a) 100 μm and (b) 50 μm , respectively.

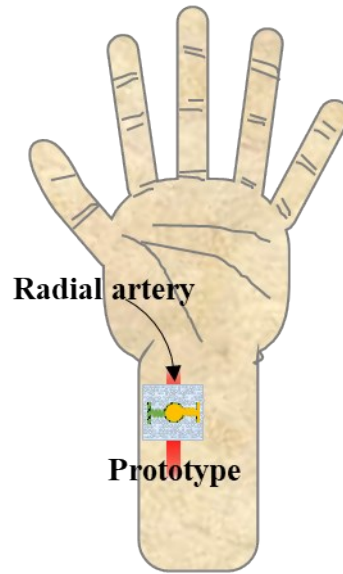




Figure S8. Experimental set-up for the radial artery pulse detection using the prototype attached to the wrist, as described in Results and Discussion.

Table S1. The pore size and porosity, measured from the porous PDMS layers, fabricated with the different weight ratios of the citric acid powders to PDMS.

Weight ratio [Citric acid : PDMS]	Pore size		Porosity	
	[μm]	CV*	[%]	CV
0.5 : 1	21.08 ± 4.29	0.20	45 ± 1.76	0.04
1 : 1	25.90 ± 5.61	0.22	56 ± 3.23	0.06
1.5 : 1	24.40 ± 10.30	0.42	55 ± 2.64	0.05
2 : 1	16.88 ± 13.35	0.79	59 ± 4.61	0.08

*CV (Coefficient of variation) = Standard deviation/Average

Table S2. Skin attachment test results using the conventional PDMS layer and the porous PDMS layer for 7 days.

	Conventional PDMS layer	Porous PDMS layer
Specimen dimension (w × l × t)	19.45 × 19.53 × 0.65 mm	19.37 × 19.38 × 0.59 mm
Skin redness level* (R _{surround} , R _{specimen})	 (21.7 ± 4.0, 8.2 ± 2.8)	 (21.8 ± 4.1, 20.0 ± 3.5)
Skin redness index (R _{surround} / R _{specimen})	2.7	1.1
Itchiness level survey from subject (0~10)	5	0
Medical diagnosis from dermatologist	Irritant contact dermatitis	N/A

* R_{specimen} and R_{surround} are the skin redness level where specimen was attached or not, respectively. Skin redness level was estimated by hue, saturation, lightness (HSL) color code that meant 0 was red and 25 was yellow.