## **Supporting Information**

## NanoPADs and NanoFACEs: an optically transparent nanopaperbased device for biomedical applications

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This Material includes:

Figure S1 to S8

Table S1

Movie S1



suspension

formation by vacuum filtration of NFC solution

dehydration by hotpress

Figure S1. Nanopaper fabrication process.



Figure S2. Mechanical testing of nanopaper. (a) Strain-stress curve of nanopaper under stretch.

(b) Nanopaper under bending to show its flexibility.



Figure S3. Measurement of transmittance at 700 nm wavelength as a function of the hot-pressing temperature. The transmittance of nanopaper was normalized with its initial transmittance value (N = 3).



**Figure S4**. Transparency of nanopaper at different conditions. (a) Measurement of transmittance at 700 nm wavelength as a function of storage time at 75 °C. The transmittance of nanopaper was normalized with its initial transmittance value (N = 3). (b) Optical photograph taken one month after nanopaper was fabricated. The nanopaper was stored in a Ziploc bag at room temperature to avoid contamination.



**Figure S5**. Cross-sectional view of liquid permeating the depth of the nanopaper for durations of (a) 0 min; (b) 10 min; (c) 20 min; (d) 40 min; and (e) 60 min. During the test, all samples were stored in a homemade saturated humidity chamber to reduce liquid evaporation. We used red dye as the sample solution for visualization. Scale bar:  $40 \mu m$ .



Figure S6. Photograph of a transparent nanoFACE bonded with 5 layers of nanopaper.



**Figure S7.** Measurement of transmittance between channel area and bonding area at 700 nm wavelength after 1 h storage at 75 °C. The transmittance was normalized with the value from channel area (N = 3).



**Figure S8.** Characterization of Au nanostars (AuNSs). (a) A representative TEM image of branched AuNSs. Scale bar: 100 nm. (b) UV-vis spectrum of branched AuNSs. The inset shows a picture of the aqueous solution of branched AuNSs.

## Table S1. Coefficients of variation of glucose colorimetric detection at different concentrations.

Concentration (mM)	0	4	8	12	16	20
Coefficients of variation	5.4	10.9	7.1	6.0	4.4	5.9
(%)						

**Movie S1**. The movie shows a drop of red food dye flowing in a nanopaper-based hollow channel and a regular porous cellulose paper channel. The movie is played in real time. Scale bar: 10 mm.