

Supporting Information

Flexible optical gas pressure sensor as the signal readout for point-of-care Immunoassay

Kai He ^{a, b, c}, Shan Xing ^{a, d, e}, Yang Shen ^{a, b, c *}, Chongjun Jin ^{a, b, c *}

^a. State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, Guangzhou, 510275, China

^b. Guangzhou Key Laboratory of Flexible Electronic Materials and Wearable Devices, Sun Yat-sen University Guang-zhou, 510275, China

^c. School of Materials Science and Engineering, Sun Yat-sen University, Guangzhou 510275, China

^d. Department of Clinical Laboratory, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine, Sun Yat-sen University Cancer Center, Guangzhou 510060, China

^e. School of Biomedical Engineering, Sun Yat-sen University, Guangzhou 510275, China

***Corresponding authors.** E-mail: ShenY33@mail.sysu.edu.cn, jinchjun@mail.sysu.edu.

Supplementary figures

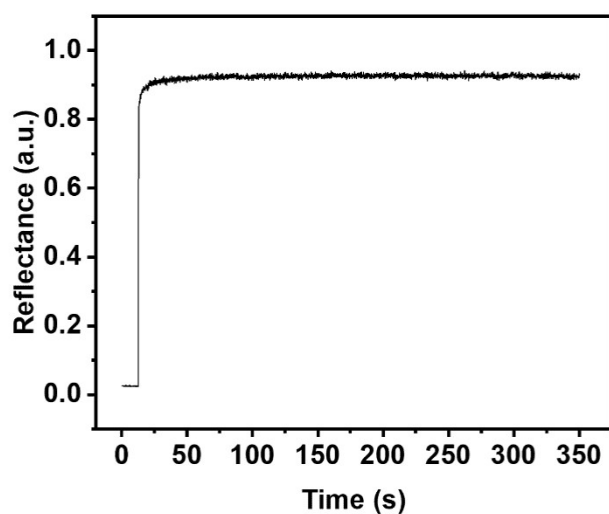


Figure S1. The gas tightness investigation of the Ag/PDMS BGPS (continuously recording the reflectance variation of the Ag/PDMS bilayer after inflating the gas chamber).

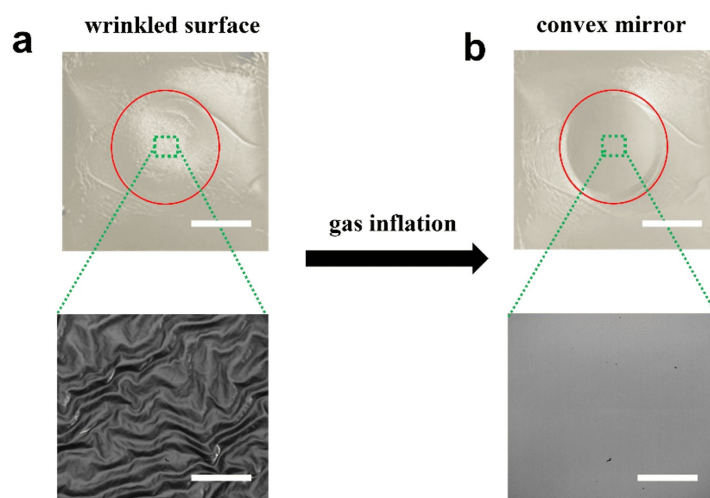


Figure S2. Photographs (top) and microscopic images (bottom) of the active area of an Ag/PDMS bilayer (a) under depressurization and (b) after gas inflation. The green dashed circle indicates the active area of an Ag/PDMS bilayer. Scale bar: (top) 5 mm, (bottom) 100 μm .

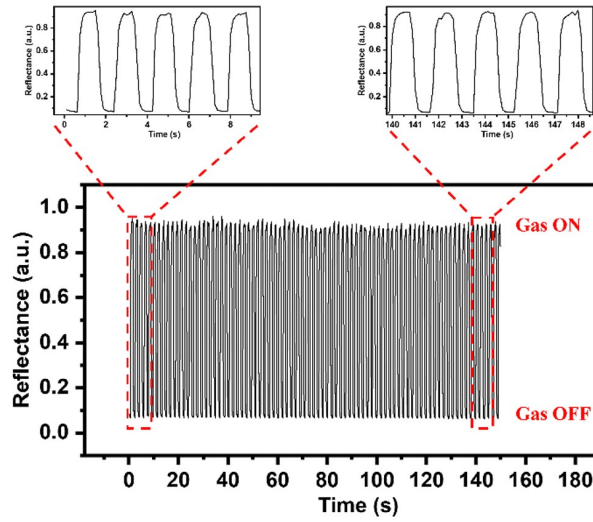


Figure S3. Cycling stability investigation of an Ag/PDMS BGPS (under a square-waveform pressure switched between 0 and 200 μl , $\lambda = 800 \text{ nm}$).

Supplementary Tables

Table S1. Summary of the performance of the AFP immunosensors.

References	methods	linear range (ng/mL)	LOD (ng/mL)
Xu S, <i>Anal. Chim. Acta</i> , 2017, 983 , 173–180	Fluorescent	0.5–60	0.16
Li C, <i>ACS sensors</i> , 2019, 4 , 3034–3041	Microcantilever	1–900	0.05
Wu Y, <i>J. colloid. Interf. Sci.</i> , 2020, 580 , 583–591	Photoelectric chemical	0.05–100	0.05
Niu Y, <i>Biosens. Bioelectron.</i> , 2017, 92 , 1–7	Electrochemical	0.1–120	0.055
Lv S, <i>Anal. Chem.</i> , 2019, 91 , 12055–12062	Electrochemical	0.1–50	0.04
our work	Optical gas pressure-based	0.05–132	0.016

Supplementary movies



Movie. S1.mp4

Movie S1. Real-time video of the optical photographs of Ag/PDMS BGPS during the gas-driven process under a square-waveform pressure switched between 0 and 200 μl .



Moive. S2.mp4

Movie S2. Real-time video of the microscopical image of Ag film wrinkling structure during the gas-driven process under a square-waveform pressure switched between 0 and 200 μl .